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3. The Instruction for the general Students is carried on daily, except on Saturdays. The Annual Sessions, each lasting five months, commence on 1st October, and 1st March, and end respectively on 28th February, and 31st July.

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7. A Register of the Students' attendance is kept, and may be consulted by Parents and Guardians.

8. THE SCHOOL FOR THE FEMALE STUDENTS passing through the General Course is at 37, Gower-street, Superintendent, Mrs. M. Iain; Assistants, Miss Gann and Miss West.

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1. CHEMISTRY, with special reference to the Arts.—A. W. Hofmann, Ph.D. F.R.S.

2. NATURAL HISTORY, applied to Geology and the Arts.—T. M. D. F.R.S.

3. PHYSICAL SCIENCE, with its Special Applications.—R. Hunt.

4. APPLIED MECHANICS.—R. Willis, M.A. F.R.S.

5. METALLURGY.—J. Percy, M.D. F.R.S.

6. GEOLOGY, with its Practical Applications.—A. C. Ramsay, F.R.S.

7. MINERALOGY.—W. W. Smyth, M.A.

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Tickets to separate Courses of Lectures are issued at 2s. and 4s. Officers in the Queen's or East India Company's Service, Acting Mining Agents and Managers, may obtain them at half the usual charge. H.R.H. the Duke of Devonshire has granted Two Exhibitions to the School, and others have also been established.

For information apply to Mr. T. REES, Registrar, at the School, Jermyn-street, London.

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Professor TENNANT, F.R.S., will commence a COURSE of sixteen LECTURES on MINERALOGY, with a view to facilitate the Study of GEOLOGY and the Application of Mineral Substances in the ARTS.—The Lectures will be illustrated by an extensive Collection of Specimens, and will begin on Friday, October 7, at 9 o'clock a.m. They will be continued on each succeeding Wednesday and Friday, at the same hour, September, 1893.

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Elocution.—Alexander Bell, Esq. English Literature and Composition, and English Language and Literature.—Henry J. Hogg, Esq. R.A., Trinity College, Cambridge.

French.—Mons. Tourrier. Geography.—Charles Colquhoun, Esq. German.—Dr. A. Heilmann, Professor of German in University College, London.

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Plagiography.—Cipriani Potter, Esq., Principal R.A. Music; H. C. Lunn, Esq., Prof. and Assoc. of R.A. Music; H. C. Singing.—F. Cox, Esq., Prof. and Assoc. of R.A. Music.

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REVIEWS

The Works of William H. Seward. Edited by George E. Baker. 3 vols. New York, Redfield; London, Low & Co.

In these three bulky volumes we have a collection of the writings and speeches of one of the most distinguished living politicians of the United States. Those who are acquainted with contemporary American politics (and we suspect that we on this side of the water are not nearly so well acquainted with American politics as the Americans are with ours) know that Mr. Seward's name is identified, in the American political calendar, with an important section of one of the two great parties—the so-called *Whigs*, and the so-called *Democrats*—into which the Republic is divided. Distinguished from each other by differences on a great variety of questions, appertaining some to the internal politics of America and others to her cosmopolitan relations,—these two parties, whose names convey to English ears no real indication of the nature of their respective principles, are further subdivided into various shades and denominations. Thus, among the Whigs, there is one section called the "Silver-greys," or "Fillmore-men," who are reckoned more Conservative in their views; while another section—known over the whole Union as the "Woolly-heads," or "Seward-men"—are regarded as more liberal and progressive. Of this latter section, as their name indicates, Mr. Seward is the recognized chief. The germs of the distinction between these two divisions of the Whig party existed long ago; but their marked separation, and the names bestowed on them in token thereof, originated in the recent discussions relative to the Fugitive Slave Bill. A more detailed account of the political tenets of the two sections, and indeed of the political parties of America generally, is given in Mr. Pulszky's recent work on America,—in which Mr. Seward's name is conspicuously mentioned.

Readers to whom this account of Mr. Seward and his political position in America may be familiar, as well as those who, without any personal prepossessions for or against Mr. Seward, may desire a good opportunity for obtaining an insight into American politics, and a glimpse of the kind of talent and character which America honours in her public men, will find much to interest them in these volumes. From a biographical sketch prefixed to the first volume—written by the editor, in the spirit of an admirer and political disciple—we learn, that Mr. Seward was born in Florida, in the State of New York, in 1801; was educated at the Union College, Schenectady, where he greatly distinguished himself; commenced business as a lawyer in Auburn, in 1823, and rapidly rose into high professional reputation; turned his attention very early to politics, and ranked himself first with the "Democratic" party, which he afterwards left for the "Whig"; was elected a member of the State-Senate of New York in 1830,—probably the youngest member who ever sat in that Senate; displayed in this his first civil office a boldness and vigour, both as a business man and as a speaker, which soon made him a leader in the house; after eight years of laborious public life, varied by a brief visit to Europe, was elected in 1838 to the high office of Governor of the State, at the early age of thirty-seven; held this office for four years; retired for a while into a more private position, though still continuing his political and forensic assiduity; and, lastly, was chosen a member of the General Senate of the United States in 1848,—to which body he still

belongs, and where, at the age of fifty-two, he commands the respect accorded by America to those whom she regards as the most prominent and able of her citizen-legislators. The biographer fills up this sketch with pretty ample details of Mr. Seward's proceedings and principles in each of the stations to which he has successively been called:—as a lawyer and pleader,—as a member of the New York State government,—as Governor,—and as a member of Congress. The impression which he endeavours to convey—and which, apart from any reference to party-politics, and allowing for the writer's bias, is evidently just,—is, that the subject of the memoir is a man really deserving to be known wherever the characters of eminent modern politicians are thought worthy of study; enlightened, conscientious, plain and sagacious in his style of thought, and extremely firm whenever he thinks himself in the right,—very American in his type, and generous and progressive in his views on many important questions affecting not only American society, but society generally.

This impression is confirmed by the writings, speeches, and official letters contained in the volumes. To those whom American politics and the state of American society interest—and that country is at present the theatre where a number of social questions of the most advanced kind are working themselves out for the behoof of speculative political philosophers in all lands, and ultimately perhaps of all nations and peoples in their corporate capacity—these writings and speeches afford excellent materials for study. We could select many passages from Mr. Seward's correspondence and speeches as a governor presenting the citizen-government of our Transatlantic kinsmen in a very favourable light,—and showing a higher theory of the function of a governor in various matters of administration, and especially in the treatment of criminals, than we are accustomed to; and from other portions of the work we could extract as many passages valuable as an American's contributions to the science and practice of popular legislation and international statesmanship. As the contents of the volumes, however, are too miscellaneous to be adequately characterized within our limits, we select but one passage, exhibiting Mr. Seward's views on the great question in which his influence has been most recently and most emphatically felt—the question of American Slavery. The following is from a speech in the United States Senate, delivered March 11, 1850, on the problem of the admission of California to the rank of a State, more especially as that matter connected itself with the national problem of the balance between the Free and the Slave States, and the threat of some of the enraged slave-holders, that the continued discussion of the Slavery Question would lead them to dissolve the Union, and found a confederate Republic of the Southern or Slave States alone.—

"When the founders of the new republic of the south came to draw over the face of this empire, along or between its parallels of latitude or longitude, their ominous lines of dismemberment, soon to be broadly and deeply shaded with fraternal blood, they may come to the discovery then, if not before, that the natural and even the political connexions of the region embraced forbid such a partition; that its possible divisions are not northern and southern at all, but eastern and western, Atlantic and Pacific; and that nature and commerce have allied indissolubly for weal and woe the seceders and those from whom they are to be separated; that while they would rush into a civil war to restore an imaginary equilibrium between the northern states and the southern states, a new equilibrium has taken its place, in which all those states are on the one side, and the

boundless west is on the other. Sir, when the founders of the republic of the south come to draw those fearful lines, they will indicate what portions of the continent are to be broken off from their connexion with the Atlantic, through the St. Lawrence, the Hudson, the Delaware, the Potomac, and the Mississippi; what portion of this people are to be denied the use of the lakes, the railroads, and the canals, now constituting common and customary avenues of travel, trade, and social intercourse; what families and kindred are to be separated, and converted into enemies; and what states are to be the scenes of perpetual border warfare, aggravated by interminable horrors of servile insurrection? When those portentous lines shall be drawn, they will disclose what portion of this people is to retain the army and the navy, and the flag of so many victories; and, on the other hand, what portion of the people is to be subjected to new and onerous imposts, direct taxes, and forced loans, and conscriptions, to maintain an opposing army, an opposing navy, and the new and hateful banner of sedition. Then the projectors of the new republic of the south will meet the question—and they may well prepare now to answer it—What is all this for? What intolerable wrong, what unfaternal injustice, have rendered these calamities unavoidable? What gain will this unnatural revolution bring to us? The answer will be: All this is done to secure the institution of African slavery. And then, if not before, the question will be discussed, What is this institution of slavery, that it should cause these unparalleled sacrifices and these disastrous afflictions? And this will be the answer: When the Spaniards, few in number, discovered the western Indies and adjacent continental America, they needed labour to draw forth from its virgin stores some speedy return to the cupidity of the court and the bankers of Madrid. They enslaved the indolent, inoffensive, and confiding natives, who perished by thousands, and even by millions, under that new and unnatural bondage. A humane ecclesiastic advised the substitution of Africans reduced to captivity in their native wars, and a pious princess adopted the suggestion, with a dispensation from the head of the church, granted on the ground of the prescriptive right of the christian to enslave the heathen, to effect his conversion. The colonists of North America, innocent in their unconsciousness of wrong, encouraged the slave traffic, and thus the labour of subduing their territory devolved chiefly upon the African race. A happy conjuncture brought on an awakening of the conscience of mankind to the injustice of slavery, simultaneously with the independence of the colonies. Massachusetts, Connecticut, Rhode Island, New Hampshire, Vermont, New York, New Jersey, and Pennsylvania, welcomed and embraced the spirit of universal emancipation. Renouncing luxury, they secured influence and empire. But the states of the south, misled by a new and profitable culture, elected to maintain and perpetuate slavery; and thus, choosing luxury, they lost power and empire. When this answer shall be given, it will appear that the question of dissolving the Union is a complex question; that it embraces the fearful issue whether the Union shall stand, and slavery, under the steady, peaceful action of moral, social, and political causes, be removed by gradual, voluntary effort, and with compensation, or whether the Union shall be dissolved, and civil wars ensue, bringing on violent but complete and immediate emancipation. We are now arrived at that stage of our national progress when that crisis can be foreseen, when we must foresee it. It is directly before us. Its shadow is upon us. It darkens the legislative halls, the temples of worship, and the home and the hearth. Every question, political, civil, or ecclesiastical, however foreign to the subject of slavery, brings up slavery as an incident, and the incident supplants the principal question. We hear of nothing but slavery, and we can talk of nothing but slavery. And now, it seems to me that all our difficulties, embarrassments, and dangers, arise, not out of unlawful perversions of the question of slavery, as some suppose, but from the want of moral courage to meet this question of emancipation as we ought. Consequently, we hear on one side demands—absurd, indeed, but yet unceasing—for an immediate and unconditional abolition of slavery—as if any power, except

the people of the slave states, could abolish it, and as if they could be moved to abolish it by merely sounding the trumpet loudly and proclaiming emancipation, while the institution is interwoven with all their social and political interests, constitutions and customs. On the other hand, our statesmen say that 'slavery has always existed, and, for aught they know or can do, it always must exist. God permitted it, and he alone can indicate the way to remove it.' As if the Supreme Creator, after giving us the instructions of his providence and revelation for the illumination of our minds and consciences, did not leave us in all human transactions, with due invocations of his Holy Spirit, to seek out his will and execute it for ourselves. Here, then, is the point of my separation from both of these parties. I feel assured that slavery must give way, and will give way, to the salutary influences of economy, and to the ripening influences of humanity; that emancipation is inevitable, and is near; that it may be hastened or hindered; and that whether it shall be peaceful or violent, depends upon the question whether it be hastened or hindered; that all measures which fortify slavery or extend it, tend to the consummation of violence; all that check its extension and abate its strength, tend to its peaceful extirpation. But I will adopt none but lawful, constitutional, and peaceful means, to secure even that end; and none such can I or will I forego. Nor do I know any important or responsible political body that proposes to do more than this. No free state claims to extend its legislation into a slave state. None claims that Congress shall usurp power to abolish slavery in the slave states. None claims that any violent, unconstitutional, or unlawful measure shall be embraced. And, on the other hand, if we offer no scheme or plan for the adoption of the slave states, with the assent and co-operation of Congress, it is only because the slave states are unwilling as yet to receive such suggestions, or even to entertain the question of emancipation in any form. But, sir, I will take this occasion to say that, while I cannot agree with the honorable senator from Massachusetts in proposing to devote eighty millions of dollars to remove the free coloured population from the slave states, and thus, as it appears to me, fortify slavery, there is no reasonable limit to which I am not willing to go in applying the national treasures to effect the peaceful, voluntary removal of slavery itself."

This passage may be taken to represent the views of those of the Americans themselves who, not belonging to the so-called "Abolitionist" party, are strenuously labouring to direct American politics towards the extinction of slavery by the slow and certain process of self-disintegration. So considered, it is a very remarkable passage. There are other passages not less remarkable on this same question of "the peculiar institution," as the Americans call it—the paramount *home-question* of America. The other great question of American statesmanship—that of the *cosmopolitical function* of America, her place and duty among the nations—has also received much attention from Mr. Seward; whose views on it may be learned from some speeches delivered in connexion with M. Kosuth's visit to the United States.

English Forests and Forest Trees, Historical, Legendary and Descriptive. With numerous Illustrations. Ingram & Co.

HERE is an octavo volume of some four hundred pages, and with some five-and-forty illustrations, on a subject dear to the heart of every lover of Nature and of matters "historical, legendary and descriptive." It is a subject as full of promise "as an egg is full of meat"—to use a quaint and expressive formula:—a subject to devour,—smacking as it does

Of forests and enchantments doar,
Where more is meant than meets the ear:—

rich with thick-rising thoughts about Sherwood Forest and the New Forest,—Windsor Forest and Dartmoor Forest,—Birmam Wood and Chevy Chase,—Inglewood Forest, and, if you

will, the Epping Hunt;—with happy recurrences to Herne the Hunter and Robin Hood,—to Walter Tyrrell and William Rufus,—to Margaret of Anjou and Hexham Forest,—to Whitelebury Forest and Elizabeth Woodville,—to Charles the Second and Trusty Dick Penderell,—to Adam Bell, and Clym of the Clough, and William of Cloudeley,—to Gurth and Wamba,—to Rosalind and Celia, and the Forest of Arden,—to Haywood Forest and Milton's 'Comus,'—to Francis the First and Fontainebleau,—to Lord Herbert of Cherbury and Chantilly,—to John Manwood and John Evelyn,—to Lord Duncan, "the House," and Sir William Molesworth,—to Wharnclyffe Lodge, and Sir Thomas Wortley, and the Buck Bell,—to Archbishop Abbot and the keeper whom he killed by accident,—to Herne's oak, and Sidney's oak,—the Boscobel oak, and the Fairlop oak,—to outlaws and wild cats, acorns and beech nuts, swine and swineherds, hawks and roebucks, "careless herds full of the pasture," heath and fern and wild flowers, and footways lost in thickets too deep and entangled to admit of entrance,—to Babes in the Wood and blackberries,—to Henry and Emma—

A huntsman Henry is when Emma hawks,
To her of tassels and of lures he talks,—

to our old poets, Chaucer, Spenser, &c., who never luxuriate more than when they get into a forest,—to our old ballad-makers, who never mention "the good forest" or "the merry greenwood" without some epithet indicative of the pleasure which they derived from the very sound of the name,—to "savage Rosa," who *did* understand forests and forest trees,—to Lee, and Creswick, and Linnell, who render English sylvan scenery with a faithful and a feeling pencil, and can, as Macbeth says, "impress the forest" upon a few feet of canvas.—These and other thick-coming fancies—like the gay notes that people the sunbeam—crowded across our mental eye as we hurried into a quiet corner with this book in our hand to devour at leisure. The subject seemed to call us in a merry note:—

Under the greenwood tree
Who loves to lie with me,
And tune his merry note
Unto the sweet bird's throat,

Come hither, come hither, come hither!

—And "sweet Echo" seemed to cry, "come hither!"—"But, Lord," as Pepys would say, how our author has disappointed us!

Our forests are fast disappearing. Acts of Parliament have passed of late disafforesting many of them. The stroke of the axe will soon be heard in solitudes unconscious before of such a sound. Windsor Forest—as far as forest character goes—could be put in a ring fence of half a mile. The New Forest suffered so severely during the late war, that there are few trees to be seen in it of any great age,—and years must elapse ere its "timbers float again." Sherwood alone possesses trees and scenery representative of old English forests; but even the portion to be found in Sherwood is scarcely two miles in extent,—so soon does it run into the *Dukeries*, and Park scenery, dissimilar in every respect to what Shakespeare calls the "uncouth forest." To find tongues in trees that can tell of outlaw life, we must go to Sherwood:—but fifty years hence, tourists will have to tell a different story. The power of cultivation has brought a corn-field within sight of Stonehenge,—a London carriage may roll with ease through all that remains of the sylvan solitudes of Robin Hood and Little John,—Burnham Beeches are disfigured by sandwich papers and empty soda-water bottles,—and a rail-road runs through the mountainous scenery of the Lakes.

But there is still another side to the picture: as in the case of Timon's villa "laughing Ceres" was soon seen to re-assume the land,—so, a greener and a thicker grass than before covers

the site of the Crystal Palace in Hyde Park. But we must not look to the renewal of an English forest:—we have no William the Conqueror to turn Hampshire into a hunting ground. What our acres shall produce is regulated more by Mark Lane than by the uncontrolled will of the richest landlord. No science could throw the *Dukeries* again into "merry Sherwood." Three centuries or more of neglect are required to constitute a forest,—and forests, as we know from the history of Royal Woods, contribute little or nothing to a rent-roll.

Our author, whoever he is, is not very well up in the reading necessary for a work of this kind. A love of Nature and a hearty relish for sylvan scenery are not in themselves sufficient to do justice to a work on English Forests and Forest Trees. In such a work we want something—and that full and accurate, too—about forest life and forest laws,—the number and extent of our forests,—and the names of their former proprietors. The greater number were of course royal forests; but with others—and those of note, and chiefly in the north of England—our kings had little or nothing to do. We should have been quite content had our author gone no further back than the Conquest:—a sufficient range for research, and even for conjecture. Even our smaller counties had their forests, or skirts of forests; and it is about these that we should like particularly to have heard. Nor are the materials—since the recent Parliamentary inquiry into the royal forests—so scanty or so scattered as some perhaps would deem them to be. The Commission of which young Mr. Hume was the secretary, threw much new and important light upon the subject; and from the large Blue Book alone chiefly compiled by his care and skill matter of moment might have been culled for a work far more perfect than the one now before us.

"The present work," we are told in the prefatory advertisement, "does not profess to be more original than works dependent upon numerous authorities usually are; nor does it profess to be either very profound or scientific. It merely aims to give a pleasing, but at the same time accurate, account of our Forests and Forest Trees." Our author does not seem to be aware that a book may be very original and yet dependent throughout on numerous authorities. Mr. Macaulay's 'History' is an original work, though professedly founded on facts collected by himself or found in authors who have described the same period of our history. But it is as well that our author does *not* profess much, since he has accomplished very little,—rather provoked an appetite than quieted one. He mentions Inglewood Forest; but does not tell us that it was the home of Adam Bell, Clym of the Clough, and William of Cloudeley,—those sylvan predecessors in reputation of bold Robin Hood. He mentions Needham Forest; but does not allude to the handsome gold torc turned up in it by a fox some seven years ago, and now in Her Majesty's possession,—perhaps the finest ornament of the kind yet discovered in this country. He is altogether silent about 'The Children in the Wood,'—that tale which has such fast hold of the popular heart,—and the Norfolk forest in which the "pretty babes"

Went wandering up and down,
But never more could see the man
Approaching from the town.

He does not say a word about the curious Elizabethan brass at Walton-upon-Thames, in which John Selwyn, "Keeper of Her Majesty's Park of Oatlands," is represented as having performed his wonderful feat before Queen Elizabeth of leaping from his horse on to the back of a stag, both being at full speed,—keeping his

seat, a present, a single origin piece of express stirrup wonder other i our tin account of the Lintot, instead, pling, sodes i of old of the clever reading about Hume, we feel conder "Let a fellow and set Mr. J single from n very tr

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seat, and killing the animal in the immediate presence of the Queen. He has, of course, not a single word about Haywood Forest and the origin of Milton's 'Comus':—that exquisite piece of forest-poetry, if we may be allowed the expression. He has nothing about "Rufus's stirrup," preserved in the New Forest:—that wonder to every Cockney tourist and object of other interest to real antiquaries.—Yet, he wastes our time with inappropriate and badly-written accounts of the origin of the order of the Garter, of the burial of Charles the First, of Pope and Lintot in Windsor Forest, of Byron at Newstead, of George the Third and the apple dumpling. We could have well spared these episodes for some accurate account, however brief, of old implements of the chase, and of the duties of the verderers of the different forests. A clever writer might make old Manwood pleasant reading to the many; but our author, who talks about "Mr. Gray," "Mr. Fielding," "Mr. Hume," and Mr. Akenaside," must be put down we fear in that class into which Dr. Johnson condemned Flexman, the dissenting minister—"Let me hear no more of him, sir. That is the fellow who made the index to my 'Ramblers,' and set down the name of Milton thus:—Milton, Mr. John."—We have not found in this book a single passage to quote, that is drawn direct from nature and the subject:—not a sketch in very truth that recalls a bit of true forest-life.

Twenty Years in the Philippines. By Paul de la Gironière. Vizetelly & Co.

WE owe this book to the vivacious author of 'Monte Christo.' Not that M. Dumas is its author:—he is only its cause. Alexander appears here as the Falstaff of romance:—he is not only a writer himself, but the cause of writing in other men. The usual "friends and admirers" had long and vainly urged M. Paul de la Gironière to give the story of his adventures to a reading and believing world. Our adventurer hesitated at so bold a step, until he one day found his name in the *feuilleton* of the *Constitutionnel* figuring among the 'Thousand and One Phantoms' of the great appropriator of other men's ideas and experiences. M. Paul de la Gironière could keep silence no longer. As a traveller he had seen strange sights—done valorous deeds—gained a marvellous experience. He had outlived a massacre, married a fortune, founded a colony,—he had combined in his own person the adventures of a Rajah Brooke and a Col. Dixon of Mairwara memory:—how, then, could he stand by and see himself reduced to a "phantom,"—and hear the story of his own colony of Jala-Jala mistold by the daring romance-writer of the *Constitutionnel*? Such resignation was not in flesh and blood. To prove that he was a man, and not a phantom,—M. Paul de la Gironière "resolved to take up the pen:—and we are glad he did so, for we have gained by his resolution an original and amusing book.

Our author is evidently a self-constituted hero. In his intercourse with himself he has all the airs of a great man—the coolness, courage, complacency, and aptitude in peril which reveal, in spite of all disguises, the born rulers of the world. He chronicles his own perfections and successes with a frankness that anticipates objection and disarms criticism. These are but the small weaknesses of strength:—and it would be hard indeed if a man who has done the heroic things recorded here were not allowed to boast of them a little. We are very well aware that reserve and modesty are no part of the education of a *Porte St.-Martin* hero:—and if the edge of the scarlet cloak will occasionally peep out beneath the more sober suit of our Don Medico, it is nature and accident rather than

the man himself that are at fault. Is not the smallest boy in the Victoria pit always able to see the hero through his changing habits? If M. Paul de la Gironière be one of the favourites of destiny, so much the better for him—and, we will add, for his readers. In spite of his occasional gasconade and perpetual self-satisfaction—or, because of these—we have found the Don an amusing companion, and we readily forgive his airs on account of his vivacity, his *bonhomie*, his ready affection, and his untiring spirits.

We must add, that there is a tender as well as a ludicrous side to the story of this long residence in the Philippine Islands. M. de la Gironière goes out alone to the ends of the earth. He forms ties, as it is in the nature of lonely men to do; he marries and sees his hearth blessed with young children; but they die in the long years, one by one, until the once solitary man is again alone,—alone with harrowing memories, spirits no longer hopeful, and energies no longer fresh. And then he returns to the old land from which he had wandered in his youth,—the same man, and yet how changed in all that gives the zest to life! The closing pages of this volume have upon them a weight of melancholy that is almost tragic.

The Philippine Islands are comparatively unbroken ground. Mackmicking has written an account of these islands; Crawford, Horace St. John, and other writers have glanced at them. An interesting MS. history of the islands, written by a resident of many years, is now before us. But we hold it no disparagement to these writers to assert that M. Paul de la Gironière has given us altogether the most lively and interesting description of life in these southern islands that we have ever seen.

To come to particulars. Let us hear Don Medico expatiate on the graces of the Manila women.—

"In the evening, Spaniards, English, and French, go to the promenades to ogle the beautiful and facile half-bred women, whose transparent robes reveal their splendid figures. That which distinguishes the female half-breeds (Spanish-Tagals, or Chinese-Tagals) is a singularly intelligent and expressive physiognomy. Their hair, drawn back from the face, and sustained by long golden pins, is of marvellous luxuriance. They wear upon the head a kerchief, transparent like a veil, made of the pine fibre, finer than our finest cambric; the neck is ornamented by a string of large coral beads, fastened by a gold medallion. A transparent chemisette, of the same stuff as the head-dress, descends as far as the waist, covering, but not concealing, a bosom that has never been imprisoned in stays. Below, and two or three inches from the edge of the chemisette, is attached a variously coloured petticoat of very bright hues. Over this garment, a large and costly silk sash closely encircles the figure, and shows its outline from the waist to the knee. The small and white feet, always naked, are thrust into embroidered slippers, which cover but the extremities. Nothing can be more charming, coquettish, and fascinating, than this costume, which excites in the highest degree the admiration of strangers."

How our Don fascinates one of these beauties—a lady beautiful as a Byronian heroine, rich as one of Marryat's damsels—and how he woos and weds her after the set fashion on the stage of the Lyceum or the Haymarket—we will not pause to relate. That he knew how to protect the beauty he had won as well as any Don who ever trod the stage, we must, however, allow him to bear witness.—

"As we went one morning to the cascades, we were about to alight at Yang-Yang, when all at once our carriage was surrounded by brigands, flying from the soldiers of the line. The chief—for we supposed him to be so at first—said to his companions, not paying the slightest attention to us, 'We must kill the horses!' By this I saw he feared lest their enemies

should make use of our horses to pursue them. With a presence of mind which fortunately never abandons me in difficult or perilous circumstances, I said to him, 'Do not fear; my horses shall not be used by your enemies to pursue you: rely upon my word. The chief put his hand to his cap, and thus addressed his comrades: 'If such be the case, the Spanish soldiers will do us no harm to-day, neither let us do any. Follow me!' They marched off, and I instantly drove rapidly away in quite an opposite direction from the soldiers. The bandits looked after me; my good faith in keeping my word was successful. I not only lived a few months in safety at Tierra-Alta, but many years after, when I resided in Jala-Jala, and, in my quality of commander of the territorial horse-guards of the province of Lagune, was naturally a declared enemy of the bandits, I received the following note:—"Sir, beware of Pedro Tumbaga. We are invited by him to go to your house and to take you by surprise. We remember the morning we spoke to you at the cascades, and the sincerity of your word. You are an honourable man. If we find ourselves face to face with you, and it be necessary, we will fight, but faithfully, and never after having laid a snare. Keep, therefore, on your guard; beware of Pedro Tumbaga; he is cowardly enough to hide himself in order to shoot you." Everybody must acknowledge I had to do with most polite robbers. I answered them thus:—"You are brave fellows. I thank you for your advice, but I do not fear Pedro Tumbaga. I cannot conceive how it is you keep among you a man capable of hiding himself to kill his enemy. If I had a soldier like him, I would soon let him have justice, and without consulting the law." A fortnight after my answer Tumbaga was no more; a bandit's bullet disembarassed me of him."

We doubt if any hero at the Victoria could have done it better. M. de la Gironière has much to do with bandits afterwards, when he becomes King Paul, founder of the colony of Jala-Jala, and ruler of the tribes of Tagaloc. But before we look on him in his little kingdom, we will glance at these Tagalocs, the people over whom he had to rule.—

"The character of the Tagaloc is extremely difficult to define. Lavater and Gall would have been very much embarrassed by it; for both physiognomy and craniology would be, perhaps, equally at a loss amongst the Philippines. The natural disposition of the Tagal Indian is a mixture of vices and virtues—of good and bad qualities. A worthy priest has said, when speaking of them, 'They are great children, and must be treated as if they were little ones.' It is really curious to trace, and still more so to read, the moral portrait of a native of the Philippine Islands. The Indian keeps his word; and yet—will it be believed?—he is a liar. Anger he holds in horror,—he compares it to madness; and even prefers drunkenness, which, however, he despises. He will not hesitate to use the dagger to avenge himself for injustice; but what he can least submit to is an insult, even when merited. When he has committed a fault, he may be punished with a flogging; this he receives without a murmur, but he cannot brook an insult. He is brave, generous, and a fatalist. The profession of a robber, which he willingly exercises, is agreeable to him, on account of the life of liberty and adventure it affords, and not because it may lead to riches. Generally speaking, the Tagalocs are good fathers and good husbands, both these qualities being inherent. Horribly jealous of their wives, but not in the least of the honour of their daughters: and it matters little if the women they marry have committed errors previous to their union. They never ask for a dowry,—they themselves provide it; and make presents to the parents of their brides. They dislike cowards, but willingly attach themselves to the man who is brave enough to face danger. Play is their ruling passion, and they delight in the combats of animals, especially in cock-fighting."

Here was material of a somewhat unpromising nature:—and we are not certain that the first demonstration of the European was quite so wise and successful as the Don himself appears to think, even taking his own account of it for gospel.—

"Two Indians came one day to lodge a complaint against one of their comrades, living at some leagues' distance from Jala-Jala. These informers accused him of having stolen cattle. After I had heard all they had to say, I set off with my guard to seize upon the accused, and brought him to my residence. There I endeavoured to make him confess his crime, but he denied it, and said he was innocent. It was in vain I promised him if he would tell the truth to grant him his pardon, for he persisted even in the presence of his accusers. Persuaded, however, that he was telling me falsehoods, and disgusted with his obstinacy in denying a fact which had been sworn to me, with every appearance of sincerity, I ordered him to be tied upon a bench, and receive a dozen strokes of a whip. My orders were executed; but the culprit denied the charge, as he had done before. This dogged perseverance irritated me, and I caused another correction to be administered to him the same as the first. The unfortunate man bore his punishment with unshaken courage; but in the midst of his sufferings he exclaimed, in penetrating accents, 'Oh! sir, I swear to you that I am innocent! but, as you will not believe me, take me into your house, I will be a faithful servant, and you will soon have proofs that I am the victim of an infamous calumny.' These words affected me. I reflected that this unfortunate man was, perhaps, not guilty after all. I began to fear I had been deceived, and had unknowingly committed an act of injustice. I felt that private enmity might have led these two witnesses to make a false declaration, and thus induce me to punish an innocent man. I ordered him to be untied. 'The proof you demand,' I said to him, 'is easily tried. If you are an honest man, I shall be a father to you; but if you deceive me, do not expect any pity from me. From this moment you shall be one of my guard: my lieutenant will provide you with arms. He thanked me earnestly, and his countenance lit up with sudden joy. He was installed in my guard. Oh! human justice! how fragile and how often unintelligible art thou. Some time after this event, I learnt that Bazilio de la Cruz—this was the name of the man—was innocent."

Man is liable to err; and it is too often through the gates of wrong that rulers pass into the path of right. Our Don seems to have had a more summary mode of dealing with the bandits who infested Jala-Jala. But, alas, for the novelty! Who has not seen the same experiment tried a thousand times with the same success in a thousand melo-dramas?

"I frequently walked in the forests alone, with my gun under my arm. Suddenly a bandit would spring out, as if by enchantment, from behind a tree, armed from top to toe, and advance towards me. 'Master,' said he to me, putting one knee to the ground, 'I will be an honest man; take me under your protection.' I asked him his name; if he had been marked out by the high court of justice, I would answer him severely: 'Withdraw, and never present yourself again before me; I cannot forgive you, and if I meet you again, I must do my duty.' If he was unknown to me, I would kindly say to him: 'Follow me.'"

Follow whither? M. de la Gironière tells us, to virtue and the church;—but with certain small concessions, as we shall see, to the old predatory instinct of his converts and followers.

"I found that it was necessary to provide some amusement compatible with the tastes, manners, and habits of my former bandits, who had led for so long a space of time such a wandering vagabond life. For this purpose I allowed hunting on all parts of my estate, conditionally, however, that I should take beforehand, as tithe, a quarter of any stag or wild boar they should kill. I do not think that ever a sportsman—one of those men reclaimed from the paths of vice to those of virtue—failed in this engagement, or endeavoured to steal any game. I have often received seven or eight haunches of venison in a day, and those who brought them were delighted to be able to offer them to me."

King Paul was, on the whole, tolerably successful with his colony. That his effects are descriptively disposed in pictures, and his virtuous and happy villagers grouped as in the background of an opera, "in vineyards copied

from the south of France," is rather the incidental result of his dramatic instinct than an impeachment of his sober truth. We have no doubt that our Don and the amiable Donna Anna, his wife, did much good at the colony of Jala-Jala; and we regret that his taste for storytelling has prevented him from setting down the practical details of his management, such as those which render Col. Dixon's account of his doings at Mairwara so interesting to the statesman and public writer.

The Don's experiment at Jala-Jala led him to explore the northern parts of the island of Luzon. Perhaps his notes on the natives of these provinces will be considered by those who delight in comparing the manners of men as the most interesting in his work. From these we can extract only a few curiosities. Here is an odd Indian custom as regards divorce.

"The Tinguian has generally one legitimate wife, and many mistresses; but the legitimate wife alone inhabits the conjugal house, and the mistresses have each of them a separate cabin. The marriage is a contract between the two families of the married couple. The day of the ceremony, the man and wife bring their dowry in goods and chattels; the marriage portion is composed of china vases, glass, coral beads, and sometimes a little gold powder. It is of no profit to the married couple, for they distribute it to their relations. This custom, my guide observed to me, has been established to prevent a divorce, which could only take place in entirely restituting all the objects that were contributed at the marriage by the party asking for divorce—a rather skilful expedient for savages, and worthy of being the invention of civilized people. The relatives thus become much interested in preventing the separation, as they would be obliged to reconstitute the presents received; and, if one of the couple persisted in requesting it, they would prevent him or her by making away with one of the objects furnished, such as a coral necklace, or a china vase. Without this wise measure, it is to be supposed that a husband, with mistresses, would very often endeavour to obtain a divorce."

Among King Paul's own subjects, the Tagalogs, the method of wooing and wedding was ancient and peculiar,—every Tagal Jacob having to earn his Rachel as the Hebrew patriarch won his bride. Marriage, says M. de la Gironière,—

"is preceded by two other ceremonies, the first of which is called *Tain manock*, Tagal words, signifying or meaning 'the cock looking after his hen.' Therefore, when once a young man has informed his father and mother that he has a predilection for a young Indian girl, his parents pay a visit to the young girl's parents upon some fine evening; and after some very ordinary chat, the mamma of the young man offers a piastre to the mamma of the young lady. Should the future mother-in-law accept, the young lover is admitted, and then his future mother-in-law is sure to go and spend the very same piastre in betel and cocoa-wine. During the greater portion of the night, the whole company assembled upon the occasion, chews betel, drinks cocoa-wine, and discusses upon all other subjects but marriage. The young men never make their appearance till the piastre has been accepted, because in that case, they look upon it as being the *avant-courier*—that is, the first and most essential step towards their marriage. On the next day the young man pays a visit to the mother, father, and other relations of his affianced bride. There he is received as one of the family; he sleeps there, he lodges there, takes a part in all the labours, and most particularly in those labours depending upon the young maid's superintendence. He now undertakes a service or task, that lasts, more or less, two, three, or four years, during which time he must look well to himself; for if anything be found out against him he is discarded, and never more can pretend to the hand of her he would espouse. The Spaniards did their best to suppress this custom, on account of the inconveniences it entailed. Very often the father of the young girl, in order to keep in his service a man who cost him nothing, keeps on this state of servitude indefinitely, and sometimes dismisses him who has served him for two or three years, and takes another

under the same title of *prétendant*, or lover. But it also frequently happens that if the two lovers grow impatient for the celebration of the marriage ceremony, for 'hope deferred maketh the heart sick,' some day or other the young girl takes the young man by the hair, and presenting him to the curate of the village, tells him she has just run away with her lover, therefore they must be married. The wedding ceremony then takes place without the consent of the parents. But were the young man to carry off the young girl, he would be severely punished, and she restored to her family."

Here we may pause. Our mark is on many another passage of this curious volume; but we have given enough to show the strangeness of its materials and the manner in which they are disposed. To those who would know more of life in the Philippine Islands, as related by the founder of Jala-Jala, we must recommend the volume from which we have drawn these extracts.

The British Cabinet in 1853.

[Sixth Notice.]

PALEY once remarked, that, although not a politician, he would not take a handsome annuity in exchange for the pleasure that he derived from observing the characters of public men, and all the incidents of Government. This privilege of observation and discussion he numbered amongst the decided advantages enjoyed by the subjects of a free country. Along with the *dulce* the practice combines much of the *utile*. England is dotted over with innumerable centres of activity, influenced by local traditions and peculiar social developments. An eminent manufacturer, of great literary attainments, observed to us not long since, that he thought he could perceive a growing tendency to "localism,"—that the uniformity of our public opinion would probably in future be more marked with the varieties resulting from the *couleur locale*. Provincial districts are certainly too often ruled by the "local" leaders, with but little regard to the feelings of the public mind:—but what these leaders *can* and *cannot* do is powerfully controlled by the magic influence of "character." It is neither territorial sway, nor the possession of vast capital, nor practised powers of public speaking, that exclusively govern. All these modes of influence can be greatly augmented or seriously diminished by "what is said and thought about" their owners. Wealth, credit, eloquence shrivel before the odium of unpopularity,—as they swell in their growth and deepen in their power when those who possess them are personally popular.

The same thing takes place even in the "High Court of Parliament." Humanity there also follows its natural law of respecting the bold and sincere, and sympathizing with whatever is courteous and genial. On turning over the political journals of the last twenty years, we have been struck with the frequent testimonies of respect offered by adversaries towards their avowed opponents. We could cite many a written and spoken eulogy from Tory pens and tongues to such characters as those of the Marquis of Lansdowne, Lord John Russell, and Lord Palmerston. We do not find the same traces of personal animosity in the strictures on the conduct of those distinguished persons which we see flowing through the bitter and censorious comments on the inconsistent career of the eminent statesman next under our notice. Even in the new organ of the Conservative party, the *Press*, we lately read an eloquent tribute to the character and talents of Lord John Russell:—but on examining the variety of criticisms penned on SIR JAMES GRAHAM, THE FIRST LORD OF THE ADMIRALTY, during the shifting vicissitudes of his career, we observe that from the most opposite quarters he has been subjected

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to great obloquy of remark. We can detect a good deal of *personal feeling* in many alike of his Conservative and his Liberal detractors,—and we observe too much of the same defect in several of his own elaborate orations. The notice of Sir James Graham in this Compilation is one of the most carefully written; and, though damaging in some of its details, it is drawn up with strict impartiality. Indeed, impartiality is the principal merit of this volume.

The compiler connects the Grahams of Netherby with the family of Montrose;—but we may observe, that the genealogists give various accounts of the descent of the Netherby Grahams, or Græmes. The following portion of the pedigree of the member for Carlisle is authentic, and not without interest:—

“Taking another leap in dates, we come to Richard Graham, Esq., gentleman of the horse to James I., who was created a baronet in 1629, by the style of Sir Richard Graham of Esk. He purchased Netherby and the barony of Liddell of the Earl of Cumberland. He subsequently distinguished himself in the royal army, particularly at Edge Hill, where he was severely wounded, and lay amongst the slain for an entire night. His grandson, the third baronet, also a Sir Richard, was advanced in 1680 to the peerage of Scotland as Viscount Preston, and sat under that title in the Scottish Parliament. He was British ambassador to the court of France for many years, and subsequently Secretary of State to James II. Upon the Revolution in 1688, the Viscount was committed to the Tower, but subsequently released. He was then detected in an attempt to fly the country, was sent to Newgate, arraigned for high treason, and condemned to death. The intercession of friends procured his pardon under the sign-manual, dated in June 1691, and his estates were not sequestered. He married the daughter of the first Earl of Carlisle; and in the person of his grandson the peerage expired. The extensive family estates passed from Charles, the last Lord Preston, to his two surviving aunts, and subsequently to the survivor of those ladies, Catharine Graham, wife of William, Lord Widdington, who, dying in 1757 without issue, devised them to her cousin, the Rev. Robert Graham, doctor of divinity, grandson of Sir George Graham, second baronet of Esk. This gentleman married the daughter of Sir Reginald Graham of Norton Conyers, and was succeeded by his eldest son, James Graham, Esq. of Netherby, who was created a baronet the 28th December 1782. Three years afterwards he married the eldest daughter of the seventh Earl of Galloway, by whom he had issue, four sons and eight daughters. His eldest son, James Robert George Graham, the subject of our present notice, was born in 1792, and educated at Queen’s College, Cambridge.”

“John of the Bright Sword,” who figures in legendary border history, is mentioned as one of the remote ancestors of Sir James Graham. Netherby Hall is the scene of Sir Walter Scott’s stirring ballad of ‘Young Lochinvar.’ We are told:—

There was mounting ‘mong Græmes of the Netherby clan;
Forsters, Fenwicks, and Musgraves, they rode and they ran.
There was racing and chacing on Cannabie Len,
But the lost bride of Netherby ne’er did they see.

The compiler does not allude to this poem; which we cite as one of the “literary” illustrations of the Netherby “Græmes.”—Their name, we may remark, is always pronounced in the Scotch fashion by the present Lord of Netherby.

The first constituency to which Sir James Graham addressed himself was, Hull; a town which has returned Andrew Marvell and Wilberforce to the Senate. We hear and read much of “the pride of family,”—but we could desire that our electoral constituencies should acquire more pride in their choice of representatives. In our own day Hull contributed another member to the Senate whose name has won deserved distinction. We allude to Col. Peyronet Thompson, the author of the ‘Corn Law Catechism,’—whose great services to the cause of Free Trade have scarcely been sufficiently estimated.—In 1818, Sir James Graham stood for Hull; and

with reference to that election, in which he was unsuccessful, the author of this work brings forward facts not generally known in the early career of the First Lord of the Admiralty.—

“Taunted with his inaptitude for business, the charge was met by an anonymous supporter, under the signature of ‘Fair play’s a jewel,’ in these words, which seemed to bear the internal evidence of authority:—‘It did so happen, that seeking only amusement abroad he found a situation of real business, and preferred it. He became private secretary to Lord Montgomerie, the British minister in Sicily, during the most interesting period of the war, and, in consequence of the illness of that nobleman, the entire management of the mission, at a most critical moment, devolved on him, not a single day passing for a considerable time in which he did not dedicate at least ten hours to business. Lord William Bentinck having resumed the functions of the embassy, Mr. Graham still retained his post, though unknown to Lord William, by the particular recommendation of Lord Montgomerie, grounded on his past services. The war still continuing, and active service in the field being anticipated, Mr. Graham, to render himself more efficient, accepted also a military situation attached to the person of Lord William, who was commander-in-chief in the Mediterranean. He was sent in this capacity to Murat, with whom, at Naples, he negotiated the armistice which separated that general from Bonaparte. Until the conclusion of the war he remained either with Lord William and the army in Italy, or was absent on various missions to the Austrian head-quarters, and was fortunate enough to obtain the praise and thanks of his employer and the Government.”

And this author further states:—

“It is well known, and has been admitted inferentially by the right honourable Baronet himself, that in contesting Hull on Whig principles he did not consult the wishes of his father, who was a staunch supporter of the Liverpool administration, and an earnest Tory partizan. Indeed, it has been matter of rumour that the necessary funds for that costly and fleeting honour were supplied by another near relative of the then Mr. Graham.”

Subsequently returned, in 1826, for Carlisle, —Sir James Graham soon distinguished himself by the uncommon vehemence of his rhetoric in assailing the old Tory party. In place of following him through all his party campaigning, we will allow another pen to describe the general effect of Sir James in the House of Commons. The historical reminiscence from whose manuscript recollections we took a picture of Lord John Russell, has given the following elaborate portraiture of Sir James Graham. Alluding to the formation of Lord Grey’s Cabinet, the writer says:—

“Along with them was placed, as First Lord of the Admiralty, a man who was destined on more than one occasion in after times to influence the fate of great parliamentary battles. This was Sir James Graham,—the representative of a minor branch of the Grahams. At that time his character had not developed itself fully. He was known chiefly as one who on the opposition benches could mass together facts with as much industry as Hume and Warburton, mould them into a system, and state them in rhetorical language, with much of the causticity of Tierney, but with far more declamatory talent. Not being born into the regular connexion of the Whigs, it was rather wonderful that they admitted him to their Cabinet, but his talents were even then too marked to be passed over with neglect. Very tall in person, with a handsome and intellectual countenance, Sir James Graham possessed great advantages for addressing an aristocratic assembly. His manner at first was apparently so mild, that in commencing one of his elaborate attacks, the hearer could scarcely conceive how much hoarded ammunition was about to be exploded, with the certainty of doing dreadful damage to his adversaries. When just about to make a spring upon his political foe, there was an air of drawing-room lassitude about the wily descendant of the Græmes that reminded one of his ancestors,—sudden in attack, and almost as merciless as sudden. Standing at the table in the calm attitude of a May-

Fair fine gentleman, who could have expected so much fierceness of antipathy to dwell within that breast? Yet so it was. In his party combats there was much of the spirit of a borderer. His sarcasm was less savage, but more subtle, than Lord Brougham’s, and he could criticise an old friend or a recent enemy in a truly damning style of mellifluous irony, in which it was difficult to determine whether the cleverness with which bitter things were said, or the well-bred air he preserved while torturing his wincing victim, was most remarkable. When he chose to prepare himself, no one could compose a speech more artistically calculated to produce effect upon a large audience of well-bred gentlemen, and as a mere elocutionist few approached his clear articulation, modulated voice, and gracefully subdued tones, that never wearied by monotony. He arranged his facts in consecutive order, and decked them with the flowers of a graceful rhetoric, that always gave one the idea that the speaker was able to do more, if he but chose. But these talents and qualifications were marred by defects that detracted from his displays. His enemies’—

—We will not, however, record what personal foes or political rivals said or thought of Sir James Graham;—and we pass on to what more indifferent persons are stated to have felt.—

“Others, again, insinuated that at bottom there was an unsoundness in his general ideas, a laxity in his views of party obligations, and a strong spice of recklessness in his character. The latter took special pains in dwelling upon his exertions on Political Economy under the pseudonym of ‘A Cumberland Yeoman,’ in which he prepared to deal with the National Debt according to Cobbett and not to Adam Smith. Some, however, made large allowances for an active intellect endeavouring to obtain strong and profound convictions for itself, and despising that cant of party which makes its creatures the idolaters of obsolete systems, and the slaves to routine habits, and augured well of the future career of a statesman who kept his mind open to conviction, and the teachings of free political reasoning.”

It is confessed on all hands that as an administrator, whether at the Admiralty or in the Home Office, Sir James Graham has shown aptitude far beyond the average of Cabinet Ministers. In debate, at various periods, and in connexion with the most opposite parties, he has also been eminently successful,—and sometimes brilliant. Many persons have wondered how, with such undoubted talents, and with the aristocratic advantages of birth, fortune, and connexion, Sir James should not have become more potential in Parliament. But a glance at his career will teach them the reason.

There are three modes by which a British statesman can exercise great influence over public affairs:—first, “on his legs” in Parliament, where he can defend his own policy, or assail that of his opponents; secondly, at his desk in Downing Street, where he can weigh the conclusions of official persons, compare their facts, and balance proposed changes against prescriptive systems; and thirdly, there is, we repeat, the intangible, but inspiring, influence of his character, and the sway of his genius and experience over other ruling persons. In other words, *debating, administrative talent, and moral power*, are the influences by which our Walpoles, Pitts, Foxes, Cannings, Wellingtons, and Peels exercised their genius of rule. It is in the third, and the noblest, of these faculties that Sir James Graham, so eminent in the other two, is deficient. Place him in any department,—and he will readily discern its most useful subordinates, and skilfully use his politic right of employing them for the public service. Let an official difficulty arise,—he will readily master the practice in similar cases, and circumspectly regard the circumstances of the new question before he will conclude as to what ought to be done. So, “upon his legs” in the House of Commons, he brings to bear upon debate an imposing person, a well-sustained (though art-

ficial) manner, excellent elocution, and nearly all the resources of a Parliamentary rhetorician,—blending together the tact of the debater with the graces of a declaimer. But let a great public crisis arise, let rival agitations prevail, let some governing spirit be required to sway the discordant elements of party, and, as his thirty years' career proves, Sir James can be accepted only as an able and artful ally,—never as an authority to guide events. With all his resources as a speaker, and his official aptitude, he seems to want the moral stamina so indispensable to first-class statesmanship.

Differing in their mode of characterizing him, all his critics concur in denying him the qualities of national leadership. Thus Mr. Roebuck writes of him.—

"Timid and fastidious, he needs the robust hardihood of mind requisite for a political chief. As a second, none can surpass him in usefulness and ability. The responsibilities of a chief, however, seem to oppress his courage and paralyse the powers of his intellect. * * His speaking, indeed, is almost without a fault—simple, clear, grave; often earnest, it always wins attention, because always deserving it. He, nevertheless, leaves his hearer unmoved, and is more apt by his own cold demeanour to repel and offend his audience than by his lucid arrangement and accurate argumentation to convince and lead them. *He was and is, in short, among the most efficient administrators, as well as the least popular ministers, of his day.*"

—And even the compiler of the volume before us talks of the qualities that "have distinguished the vacillating statesman, and claimed respect almost in spite of judgment." With greater subtlety of observation, Mr. Francis, in his 'Orators of the Age,' thus contrasts the moral effects of Sir James Graham with those produced by Sir Robert Peel and Lord John Russell.—

"Not so Sir James Graham. He has not, amidst his many changes of opinion and party, preserved the same high character, the same freedom from the imputation of partizanship, the same presumption of stainless motive, that have upheld Sir Robert Peel, and retained for him the personal favour of the House of Commons, even in the most critical and dangerous periods of his fortunes. Still less has he observed that steady devotion to early received and professed opinions, that tolerant and liberal appreciation of the principles and views of opponents, that gently repulsive retirement from stage to stage of party defence in the face of the advancing enemy, which, together with many personal qualities of an amiable character, have secured for Lord John Russell so much of the regard of foes as well as of friends. Sir James Graham has acted on wholly opposite tactics. There has been more (so to speak) of brigandage, more of the loose policy of the Free Lance, in his political life. His attacks have always been fierce and virulent in inverse proportion to what has proved to be the depth of his convictions, and to the apparent necessity of the case; his defences have always been distinguished by a blind and passionate obstinacy; his compromises and abandonments of professed opinions have always been sudden. These are great defects of character in the eyes of Englishmen, and they re-act upon Sir James Graham, and lessen his consequence as a statesman, to this hour, in spite of his commanding talents and great position."

The sketch in 'The British Cabinet' supplies abundant passages illustrative of the truth of the extract from Mr. Francis's essay on Sir James Graham. The personal feeling which that eminent statesman has always thrown into his speeches, whether at the Tory or at the Liberal side, detracts greatly from his historical dignity. For example, mark the intense bitterness of the clap-trap declamation in the following passage, in an invective delivered against the Ministry of the Duke of Wellington and Sir Robert Peel in 1830.—

"Sir, I have heard something of the luxury of the present times. I do not know whether the example was drawn from the gorgeous palaces of kings—or

the rival palaces of ministers, splendidly provided for them by the public—or from the banquets of some East India Director, gorged with the monopoly of the China trade—or from some Jew loan contractor, who supplies hostile armies with gold drawn from the coffers of the Bank of England, and lends money to France arising out of profits on loans contracted here in depreciated paper, but which must be paid in gold."

—"The gorgeous palaces of kings" was of course in allusion to Windsor Castle, then recently restored, and Buckingham Palace, then in progress of erection. "The rival palaces of ministers, splendidly provided for them by the public," was an oblique allusion to Apsley House, which "the Duke" had just refaced and improved, after having resided for some time at the Treasury. The allusions to "gorged East India Directors," and to the Jew loan contractors, are made in a style more befitting 'Cobbett's Register' than the speech of a statesman addressing the Senate,—and they contrast very strongly with the tone of Sir James's Conservative speeches four years afterwards. The vehemence with which he has spoken on opposite sides of the same question is very remarkable,—and was once brought under the notice of the House of Commons with great effect by the present Master of the Rolls. On the occasion of the "Aggression Bill" in 1852, Sir James Graham having made a personal and taunting appeal to Sir John Romilly, the latter replied by quoting the following words, delivered by his assailant in 1835, when he assisted in defending the Irish Church.—

"Whig principles consist no less in love of liberty than in jealousy of Popery as an instrument of dominant political power, and in ardent uncompromising attachment to the Protestant religion as by law established in these realms. No death-head and cross-bone denunciations against the free exercise of the election franchise. No prayer of mercy limited to Heaven, but denied on earth, to the unhappy Catholic who shall dare to vote for a Conservative candidate."—(1835). *Hansard*, 3. S., Vol. 27, p. 440.

Of the speech to which Sir John Romilly replied, it is enough to say, that it was marked by vast rhetorical ability, and a total disregard of the tone which Sir James Graham had assumed for several years before. The *Edinburgh Review*, in an article on Parliamentary Reform which appeared soon after, stated that if "a general election had just then occurred, Sir James Graham would probably have been excluded from Parliament, unless he were to descend to an Irish constituency." It is worthy of notice also, that the same influential organ published a most damaging character of Sir James Graham in the year 1834, when he succeeded from Lord Grey along with the present Lord Derby. This is the more remarkable, as the *Edinburgh* admitted that the honour and motives of Mr. Stanley (Lord Derby) were above reproach. We know also, that during the time of Lord Melbourne's Ministry, the late Lord Spencer (the "Lord Althorp" of the Reform Bill era) at a dinner of the leading members of the "Useful Knowledge Society," remarked as follows:—"Well, when I was in the House of Commons, often I was on thorns lest some terrible indiscretion should be committed by Sir James Graham, and something should leap out of his mouth which would injure our side." On turning over Sir James Graham's speeches, we find innumerable proofs that Lord Spencer was justified in his apprehensions. Thus, when Sir Robert Peel, during the Repeal crisis, was proceeding to found the Queen's Colleges, Sir James Graham did the Ministry great damage by telling the Roman Catholic members "that conciliation with Ireland had reached its utmost limits:"—an indiscretion of which Lord John Russell and Mr. Macaulay soon availed themselves. It

was nearly at the same period that he had the rashness to commit himself by assailing the Recorder of Dublin (Mr. Shaw, M.P. for the University) with facts relating to Mr. Shaw which Sir James could have learnt only in the private transactions of "party." Our readers will find this circumstance skilfully treated of, *ad invidiam*, in Mr. Disraeli's *Life of Lord George Bentinck*.

In fact, in assailing his adversaries, like an awkward fencer, Sir James over-reaches himself. But his indiscretions, and too great proneness to personality and supercilious treatment of his adversaries, were doomed to receive retribution in the Mazzini *espionage* case. We well remember the whole of Sir James Graham's conduct on that unpleasant occasion,—which left a most unfavourable impression behind. Nothing could be more unfortunate than the defiant manner with which he in the first instance met the charges vigorously preferred against him by Mr. Thomas Duncombe. On a question on which the feeling of Englishmen is peculiarly sensitive, he exhibited "that hardness and impassibility of temperament which are impervious to censure or to obloquy." But he had to change his tone when the late Mr. Shiel and Mr. Macaulay applied the knout with great severity. What was most remarkable was, the enjoyment which so many members of Parliament felt at "the Cumberland yeoman" being in a scrape. The feeling towards him showed the extent of his personal unpopularity amongst the friends and the foes of the party to which he then belonged.

In examining Parliamentary history, we have been amused (and pleased) at the identity of votes and principles between two "George Byngs"—father and son—successively members for Middlesex. They might be mistaken in the division lists for one person. But in examining Sir James Graham's votes and speeches, we think at once of the Wolfian hypothesis on the Homeric Poems. Imitating the critical reasoning followed by the German commentator, we might, with references to *Hansard* and contemporary history, affect to show that there had been certainly two Sir James Grahams in the age of Queen Victoria, and that further historical discoveries would probably reveal that there were not less than three. We could pretend to great nicety of discrimination between "Sir James," popularly called "The Cumberland Yeoman,"—Sir James, the great Conservative statesman,—and a third Sir James, attacked by the *Edinburgh Review* for his vehement support of the friends of Cardinal Wiseman. It would seem to take "three single gentlemen" to roll into one Sir James. But without any satirical distortion of the facts of Sir James Graham's career—which "does not make up into a whole,"—we may say, that he belongs to that class of men, whether generals, or statesmen, or orators, of whom Voltaire wrote the line, pregnant with meaning,—

Telle brille au second rang, qui s'éclipse au premier.

His characteristic inconsistency deprives him of the higher power alluded to by Lord John Russell, in a sentence of deep truth (and quoted by us already),—"It is the nature of Party in England to ask the assistance of a man of genius, but to follow the guidance of a man of character."—In short, it is the result of the distinguished, but inharmonious career of Sir James Graham, that he will be always courted as an auxiliary in Parliament, but never, like some of his contemporaries, deferred to even for a week as an autocrat in an emergency.

SIR CHARLES WOOD, as President of the Board of Control, holds a post of great importance at the present time. Son-in-law of the late Earl Grey,—he was also his Private Secretary,

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and had thus the invaluable advantage of official training at an early period of life. His connexion with "the Greys" gives him also the resources of "connexion,"—that potent aid in our English politics; and his own assiduous habits, clear but rather limited understanding, and eminent clerical qualities in office, make him a very useful politician. In the regular routine business of Parliament he is pains-taking, and up to the standard required for the second class of ministers. But he has not an original intellect nor a commanding style,—and at times he is deficient in *bonhomie*. He has had great opportunities given to him for winning a position,—as, for instance, when the present Earl Grey left the Melbourne ministry. But he is not fitted for an orator or a leader. We confess, that there seems to be much reason in the remarks of those who think that at the head of the Indian Department there ought to be more presiding genius and more original intellect than his antecedents, however respectable, warrant us in hoping for from Sir Charles Wood. He has now arrived at his fifty-third year;—when it is too late to hope for "the great," if symptoms of it have not strikingly appeared before.

LIST OF NEW BOOKS.

Abernethy's Memoirs, by G. Maclellain, 2 vols. post 8vo. 21s. 6d.
 Allifield, by the Author of "John Drayton," 3 vols. post 8vo. 31s. 6d.
 Astronomical Annual for 1845, 18mo. 1s. 6d.
 Bacon's Manna in the House: Matthew and Mark, 6s. 6d.;
 Ditto, Luke, 6s.
 Bread upon the Waters, 18mo. 1s. 6d.
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MR. HUGH EDWIN STRICKLAND.

LAST week, we made the painful announcement of the melancholy death of Mr. Strickland, by a terrible accident on the Manchester, Sheffield, and Lincolnshire Railway. Mr. Strickland had been, as we then said, attending the Meeting of the British Association at Hull,—and, as our account of the proceedings will show, had taken an active part therein. He was a staunch friend of the Association,—and we remember few Meetings from which he was absent. His devotion to science was the cause of his death. Previous to the Hull Meeting, his attention had been directed to the cutting at Claborough, near Gainsborough, as one of high geological interest; and here, whilst, at its close, in the act of investigating the strata, he met, as we have said, with his untimely end. He stepped from one line of rails, to get out of the way of a train seen to be coming up,—on to the other, in the way of an unseen train emerging from the tunnel.—The rail-

way has in this instance exacted a heavy return for all the advantages which it confers on science.

Mr. Strickland was in the prime of life,—at that age when the promise of youth is fast realizing itself. He was born at Righton, in the East Riding of Yorkshire, on the 2nd of March, 1811. His father, Mr. Henry E. Strickland, of Apperley, in Gloucestershire, was a son of the late Sir George Strickland, Bart., of Boynton, in Yorkshire. He was a grandson on his mother's side of the celebrated Dr. Edmund Cartwright,—whose name is so indissolubly connected with the manufacturing greatness of England on account of his invention of the Power-loom.

Mr. Strickland's boyhood was spent under his father's roof; where he was under the private tutelage successively of the three brothers Monkhouse,—one of whom is now a Fellow of Queen's College, Oxford. From his father's house he was transferred to the late Dr. Arnold,—who, prior to his appointment at Rugby, took private pupils at Laleham, near Staines. He finished his education at Oriel College, Oxford.

Although distinguished for his classical knowledge, Mr. Strickland had early acquired a taste for natural history pursuits; and after the completion of his studies at college he resided with his family at Cracourt House, near Evesham, Worcestershire,—where he studied minutely the geology of the Cotswolds and the Great Valley of the Severn. Some of his earliest published papers were on Geology; but his first effort as an author indicated a taste for the pursuits of his maternal grandfather. It appeared in the *Mechanics Magazine* for 1825,—and was on the construction of a new wind-gauge.

In 1835, Mr. Strickland travelled in Asia Minor, in company with Mr. W. J. Hamilton, M.P.,—who was then Secretary to the Geological Society. An account of this journey was published, in two volumes 8vo., by Mr. Hamilton, in 1842, under the title 'Researches in Asia Minor, Pontus, and Armenia.' This tour resulted also in the publication of several interesting papers on the geology of the districts visited, both by Mr. Strickland himself and conjointly with Mr. Hamilton. The principal papers published by Mr. Strickland singly were—'On the Geology of the Thracian Bosphorus,'—'On the Geology of the Neighbourhood of Smyrna,'—and 'On the Geology of the Island of Zante.' He early devoted his attention to the study of birds; and during this journey he gave proof of his ornithological knowledge by adding to the list of birds inhabiting Europe the *Salicaria olivacea*. He subsequently devoted a large share of his attention to the study of birds:—as his papers in the 'Annals and Magazine of Natural History,' and in Sir William Jardine's 'Contributions to Ornithology' amply testify. His principal work, however, on this subject, and the one which will give him a place amongst the classical writers on the ornithology of this country, is devoted to the history of the Dodo. This work was published, as our readers will remember, in 1848,—with the title 'The Dodo and its Kindred; or, the History and Affinities of the Dodo, Solitaire, and other Extinct Birds.' It was handsomely illustrated; and was an example of how the difficult subject of the affinities of extinct animals should be dealt with. Mr. Strickland was aided in the osteological portion by Dr. Melville. Since the appearance of this work, he has twice published supplementary notices regarding the Dodo and its kindred, in the 'Annals and Magazine of Natural History.' One of Mr. Strickland's last contributions to science was on the subject of ornithology,—when, in the Section of Natural History, the day before his death, he gave an account of the Partridge (*Tetrao gallus*) of the great Water-Shed of India, recently illustrated in Mr. Gould's 'Birds of Asia.'

Although as a zoologist ornithology was his strong point, Mr. Strickland had an extensive knowledge of the various classes of organized beings. Thus, several of his papers were devoted to accounts of the Mollusca, both recent and fossil, in various districts. One of his papers at the last Meeting of the British Association at Hull was, as our readers will see elsewhere, 'On the Peculiarities of a Form of Sponge (*Halichondria saberea*).'

Mr. Strickland paid a large share of attention to the terminology of Natural History,—and was the reporter of a Committee appointed by the British Association to consider of the rules by which the nomenclature of zoology might be established on a uniform and permanent basis. These rules were principally drawn up by him; and they have since their publication been very generally acted on,—and have contributed greatly to simplify Natural History nomenclature.

The general principles of classification could hardly fail to interest a mind so discursive as his,—and, accordingly, we find him at various times publishing on this subject. In an early number of the 'Annals and Magazine of Natural History' he inserted a paper 'On the true Method of discovering the Natural System in Zoology and Botany,'—in which he displayed a great knowledge of the forms of animal and vegetable life. In the Reports of the British Association for 1843 he published a paper 'On the Natural Affinities of the Insectivorous Order of Birds'; and again, in the 'Magazine of Natural History,' vol. 2,—'Observations on the Affinities and Analogies of Organized Beings.'

It must be obvious, that the labours to which we have alluded imply an immense amount of industry,—but in the midst of all his practical investigations Mr. Strickland found time for purely literary work. Thus, in 1847, he undertook to edit for the Ray Society a work, the collection of materials for which had cost Prof. Agassiz many years of labour, entitled 'Bibliographia Zoologica et Geologica.' Three volumes of this great work are published,—and the fourth and last is now in the hands of the printer. Mr. Strickland's labour here was not merely that of editing—it embraced the contribution of a large mass of additional matter, amounting to a third or a fourth of the whole. He spared no pains to make this work complete;—and it must ever be regarded by the zoologist and the geologist as a most valuable gift to the sciences which they cultivate.

On the occurrence of the illness of Dr. Buckland, and his withdrawal from the duties of the chair of Geology at Oxford,—every one felt the propriety of inviting Mr. Strickland to deliver lectures in his place. Though young for so important a post, and with a reputation in other departments of science, he was found able to sustain the fame of his predecessor in this,—and brought to bear with great advantage the stores of his varied knowledge upon a science which is always susceptible of influence and amplification from the principles of other departments of science, however distant from it they may at first sight appear.—The Reports of the British Association, the Transactions of the Geological Society, the papers of the Quarterly Journal of the Geological Society of London, and of the London and Edinburgh Philosophical Magazine, all testify to Mr. Strickland's activity as a geologist. They contain a mass of valuable observations both on paleontology and on the physical structures of rock in this country and in other parts of the world,—which must for ever remain a part of the history of the science of geology, and constitute a permanent monument of the industry and earnestness of the man who made them.

In several of his geological papers, Mr. Strickland's name is connected with that of Sir R. I. Murchison:—especially in a work on 'The Geology of Cheltenham and its Neighbourhood.' He assisted Sir Roderick in preparing for the press his great work on the Silurian system; and the proof-sheets of his new work on Siluria all passed through Mr. Strickland's hands,—the last of the work having been corrected at Hull.

At the time of his death, Mr. Strickland was engaged in working on his 'Ornithological Synonymy,'—the printing of which was delayed only to render it more full and complete.—He possessed a very ample and useful library,—also extensive geological and ornithological collections,—which are now at his residence at Apperley Green, near Tewkesbury.

In 1845, Mr. Strickland was married to the second daughter of Sir William Jardine, Bart:—both of whom, with Mr. Strickland's father and mother, survive to lament his premature loss.

In the above brief sketch we have spoken only of Mr. Strickland's scientific career,—but he had moral qualities that endeared him to all who knew him. Few came in contact with him who did not recognize in him a conscientious, amiable, and excellent man. In him Oxford has lost a Professor whom she could ill afford to part with at this time. To him, they who hoped for the wider culture of natural science at Oxford looked as to one who had the power and the ability to take a lead. The scientific Societies have lost in him a member who was unwearied in his assiduity to carry out their objects in all their purity. His means made him independent of his labours;—and all recognized in his exertions that love of science and its objects which constitutes the true philosopher.

THE CHINESE INSURRECTION.

"Is Tien-tè a Man or a Myth?"

WILL you permit me to trouble you with a few remarks relative to your Correspondent's highly interesting and instructive letter, contained in the *Athenæum* of the 17th instant.

In the first place, as the case of the Chinese insurgents now stands before the public, the "rivalry" between Tai-ping and Hough-sieou-tsiuen, to which your Correspondent alludes, does not exist, nor ever can. In their fourteenth chapter, MM. Callery and Yvan tell us that Hough-sieou-tsiuen takes the title of Tai-ping-wang, or King Grand Pacificator,—that is to say, that the "rivals" are one and the same person. Unless some new evidence shall disprove their identity, there is no more discrepancy in this part of the story than would arise from the same illustrious individual being called sometimes "Arthur Wellesley," sometimes the "Duke of Wellington." And now for the actuality of Tien-tè. My hypothesis that he is a sort of *roi-faîné* is merely an inference drawn,—and I think fairly drawn—from a comparison of the statements of MM. Callery and Yvan with those of Mr. Meadows, and may be looked upon as merely conditional. I approximated "Celestial Virtue" to zero, by making him a "do-nothing,"—and if any *savant* goes a little further, and proves him to be a "be-nothing" likewise, I shall consider the said *savant* rather as an ally than as an opponent.

However, I must say that I do not think the existence, or rather the past existence, of Tien-tè is disproved yet. He certainly seems shorn of everything except his past existence,—but for that very reason we should be the more scrupulous about depriving him of his one little possession. Even the "possible fly" of Martinius Scriblerus had a right to its possibility.

Your Correspondent appears to think that his statement of the operations of the "Triad Society" throws a new light on the subject of the Chinese insurrection. Far, however, from this being the case,—the importance of the society is recognized by MM. Callery and Yvan in their seventeenth chapter, and they state that the armies of the Pretender are almost wholly composed of members of this and two kindred societies. Yet, their knowledge of these matters does not shake their belief in the existence of Tien-tè.

It is by the discovery that Tien-tè's name is identical with that of the "Triad Society," that your Correspondent would explain away the existence of the descendant of the Mings. Is he quite sure of that identity? I am no Sinologist, but when I look for "earth" in Bridgman's "Chinese Chrestomathy," I find that the Chinese equivalent is "ti," which according to the scheme of pronunciation is to be spoken as if spelt in English "tee." Now, "Tien-tè" is copied *literatim* from MM. Callery and Yvan's original work, and therefore is to be pronounced according to the French rule,—that is to say, "tè" is to sound, not like English "tee," but like English "tay." Pronunciation may vary, you will say; but let me add, that the Chinese character which is put by Mr. Bridgman as the visible representative of "ti," the "earth," is not one of the two characters placed below the portrait of Tien-tè published by MM. Callery and Yvan. To those who are learned in the Chinese language my remarks may appear

very ignorant;—but as the case at present stands, I certainly do not see why we are to assume that M. Callery, a known professor of the language, has translated the name "Tien-tè" incorrectly by rendering it "Celestial Virtue" instead of "Heaven and Earth." However, on this point I am most willing—nay, anxious—to be enlightened.

Even supposing the name of the alleged Pretender should turn out to be the same with that of the "Triad Society,"—does it follow as a necessary consequence that Tien-tè is a myth? We find that in China, Emperors (like Popes in Europe) assume new and significant names on ascending the throne,—and certainly there is nothing absurd in the notion that the alleged descendant of the Mings should adopt a name already held venerable by his followers. At all events, I submit, there is nothing sufficiently absurd to make us reject the united evidence of MM. Callery and Yvan and Mr. Meadows that Tien-tè is an historical personage, without some further fact being brought forward in proof of the mythical theory. Yours, &c.

Sept. 19.

J. OXFORD.

P.S. Perfectly understand, that all I have said relates merely to the statements now before the public. The next mail may demolish all hypotheses alike. Suppose, for instance, Tai-ping were to prove a myth, and Tien-tè the only reality. In such a fog as we are at present under, everything is possible.

OUR WEEKLY GOSSIP.

WILL Lord John Russell give us an Educational franchise? This is a question often asked of late, and made the subject of not a little literary speculation. It is put in a rather startling way in a scheme sent to us for an opinion,—and which, we are informed, "has received the careful consideration of several members of the Legislature, of various political opinions, as well as of literary, scientific and professional men." We are further assured, that these several personages "have all given it their approval."—Our readers will remember that we have urged again and again the importance, the necessity, and the logic of an educational franchise, clear in its terms and certain as a test, in place of the ten-pound definition of intelligence now in use. But, for ourselves, we cannot accept the scheme now offered as meeting either the justice or the policy of the case. It is proposed, to take from the present Borough constituencies seventy of their representatives,—and to erect seventy new and totally isolated constituencies out of the learned Societies, the law courts, the universities, and the half-pay naval and military heroes. Few practical men, we think, would listen to the first proposal: we do not understand how a single individual conversant with actual life could admit the second. The true purpose of an educational franchise is to give intellect free play,—to allow it full weight in the great constituencies,—not to withdraw it from them altogether. What we want is, a rule which will enable it to leave the mass, not to separate from it. Neither do we imagine that close little corporations of scholars, soldiers and parsons would be more likely to agree in the choice of the best men than more miscellaneous bodies of electors. We take it, that an educational franchise, to be useful and practical, must disturb nothing and confuse nothing. All that is needed is, some change of definitions. The present theory of our constitution—in Lord John Russell's own interpretation—is, that the House of Commons represents the intelligence of the country. This is a fancy rather than a fact,—but it is useful even as a fancy. The only point at issue is, whether the forty-shilling freehold, the fifty-pound tenancy at will, and the ten-pound house rent, be surer measures of electoral intelligence than the possession of learned diplomas, certificates, and the like. Reasonable men begin to see that they are less sure; that a man's attainments in literature and science may be more correctly ascertained than by means of his rent-book,—that, in fact, an intellectual qualification is not purchasable for so many shillings or pounds. Hence the new interest felt in wedding civil rights to educational efforts. Such a proposal, however, as that submitted to us, strikes

us as more likely to make mischief than to secure the real objects sought; and, with all proper deference to the "members of the Legislature of various political opinions," and to our "literary, scientific, and professional" brethren, we think the Government will do well to reject so impolitic and visionary a scheme.

A contemporary has brought the long-disputed point as to whether stamped journals can be legally posted after seven days from date to an issue—so far as the express opinion of the Post-Office authorities can settle it. The answer to a special application on the subject declares, that "the limit of seven days from date of publication for posting newspapers does not apply to those forwarded from one part of the United Kingdom to another."

A medical breakfast has come to be almost a part of the regular proceedings of the meetings of the British Association—and the last meeting at Hull offered no exception. On Monday morning the medical members of the Association met a party of not less than forty of their brethren residing at Hull. Dr. Horner, of Hull, was in the chair; and amongst the guests present were Dr. Neil-Arnott, Dr. Balfour, Dr. R. G. Latham, Dr. Lankester, Dr. Camps, Dr. Norton Shaw, Dr. Daubeny, Prof. Helmholtz, and Dr. Redfern.—Such meetings are additional inducements to attend the meetings of the Association, and the means of promoting a deeper interest in science amongst the members of a profession who so largely contribute to the proceedings of the British Association.

The inventor of Berdan's gold machine, which has created a great sensation in the mining world, and which we noticed in the *Athenæum* of the 13th of August, has just arrived from New York, with two full-sized machines,—which are now in process of being erected in premises near the canal in the City Road. There they will be set to work within a few days,—so that all who have any interest in such matters may satisfy themselves of the truth of the reports which have been circulated with respect to their capabilities for pulverizing, washing, and amalgamating the ore submitted to them at one operation, so effectually as not to leave in the refuse a trace of gold that can be detected by careful analysis. Mr. Berdan, it is said, has made some important improvements and additions to the machine; and has invented a new separator, which it is said will secure every atom of the mercury, and consequently of the gold in affinity with it. This, we are told, far from being the case with separators now in general use.—It is said that a company will be immediately formed for the manufacture and sale of the machines in this country,—and that measures are taking to carry on the business on a very large scale.

The Manchester journals have announced the death of Mr. George Bradshaw, of the firm of Bradshaw & Blacklock, proprietors of the well-known *Railway Guides*, and of other useful topographical works. He died at Christiania, in Norway, on the 6th inst., of cholera.

In digging out the ruins of Pompeii, every turn of the spade brings up some relic of the ancient life, some witness of Imperial luxury. For far the greater part, these relics have a merely curious interest; they belong to archaeology, and find appropriate resting-places in historical museums. But there are some exceptions. Here, for instance, the excavator drops, an uninvited guest, upon a banquet,—there he unexpectedly obtrudes himself into a tomb. In one place, he finds a miser cowering on his heaps,—another shows him bones of dancing girls and broken instruments of music lying on the marble floor. In the midst of painted chambers, baths, halls, columns, fountains—among the splendid evidences of material wealth—he sometimes stumbles on a simple incident, a touching human story, such as strikes the imagination and suggests the mournful interest of the great disaster,—as the sudden sight of a wounded soldier conjures up the horrors of a field of battle.—Such, to our mind, is the latest discovery of the excavators in this melancholy field. It is, a group of skeletons in the act of flight, accompanied by a dog. There are three human beings, one of them a young girl,—with gold rings and jewels still on her fingers. The fugitives had bags of gold and silver with

them, new, and the young man above turned—dying an in-laws picture by the quickly unusu- trouble they strange flames rocks what darker Bay is thick mount liquid silver time behind with the the wret- lets?—where menst and d gold it final forest girl's No ti on,—all the wealth gone l the n manki or ad Wh nounc covery at a d an an of the that it house a wide two a skelet is sur Sarro The Belgi most d discover Balthe Tacitu after assess which carryi came n named of him On says t at Ber the co Ursa comet declini at the dimini easily The a Great is said carry announ prude port a

them, snatched up, no doubt, in haste and darkness. But the fiery flood was on their track:—and vain their wealth, their flight, the age of one, the youth of the other. The burning lava rolled above them and beyond; and the faithful dog turned back to share the fortunes of its mistress,—dying at her side. Seen by the light of such an incident, how vividly that night of horrors looms upon the sense! Does not imagination picture that little group, in their own house, by the side of their evening fountain, languidly chatting over the day's events and of the unusual heat? Does it not hear, with them, the troubled swell of the waters in the Bay—see, as they do, how the night comes down in sudden strangeness, how the sky opens over head and flames break out, while scorers, sand and molten rocks come pouring down! What movement, what emotion, what surprise! The scene grows darker every instant,—the hollow monotone of the Bay is lifted into yells and shrieks,—the air grows thick with dust and hot with flames,—and at the mountain's foot is heard the deadly roll of the liquid lava. Jewels, household gods, gold and silver coins, are snatched up on the instant. No time to say farewell; darkness in front and fire behind, they rush into the streets—streets choked with falling houses and flying citizens. How find the way through passages which have no longer outlets?—confusion, danger, darkness, uproar everywhere;—the shouts of parted friends, the agony of men struck down by falling columns;—fear, madness, and despair unchained;—here, Penury clutching gold it cannot keep,—there, Gluttony feeding on its final meal, and Phrenzy striking in the dark to forestal death. Through all, fancy hears the young girl's screams,—the fire is on her jewelled hand. No time for thought,—no pause:—the flood rolls on,—and wisdom, beauty, age, and youth, with all the stories of their love, their hopes, their rank, wealth, greatness,—all the once affluent life—are gone for ever. When unearthed after many ages, the nameless group has no other importance to mankind than as it may serve “to point a moral or adorn a tale.”

While on this subject, we may mention an announcement from Naples to the effect that a discovery has been made between Sarno and Scafati, at a depth of between only three and four feet, of an antique villa, whose architecture resembles that of the Pompeian edifices,—the only difference being, that it is sustained on arches and buttresses. The house is entire,—and contains ten chambers, besides a wide vestibule. In it were found two amphore, two agricultural instruments of singular form, the skeleton of a man and that of a bird. The edifice is surrounded by water, from the filtrations of the Sarno,—and it will be difficult to preserve it.

The *Brussels Herald* says:—“The archives of Belgium were last week enriched by one of the most curious documents which have recently been discovered. It is the autograph confession of Balthazar Gérard, the assassin of Guillaume le Taciturne, Prince of Orange,—written, immediately after his arrest, the 10th of July, 1584. The assassin gives most minutely in detail all the plans which he had formed in the six preceding years for carrying out his project.—This historical paper came accidentally into the hands of a bookseller named Jacob of the Hague,—and was purchased of him by the Belgian Government.”

On the night of the 11th of the present month, says the *Times*, Mr. C. Bruhns, of the Observatory at Berlin, discovered a pretty large nebulosity in the constellation Lynx, near the stars κ and ι of Ursa Major,—which was ascertained to be a new comet by its motion. At 1 hour 12 minutes after midnight its right ascension was $126^{\circ} 59'$, and its declination $44^{\circ} 52'$ north; the former was increasing at the daily rate of $1^{\circ} 27'$, and the latter was diminishing about half a degree. This object was easily seen with the “comet-seeker.”

The “Interim Acting Committee” for promoting a Great Industrial Exhibition for Scotland have, it is said, come to the resolution not to attempt to carry out the proposal next year, as originally announced. “This decision is considered to be prudent, as the undertaking had not received support and encouragement from those whose names

would give confidence to the people of Scotland in a matter of the kind.”

We live in an age of such scientific marvels, that scepticism dare scarcely walk on scientific ground,—and nothing seems impossible that can be formulated in words. Certain, however, it is, that scientific projection in America takes such giant proportions as make credulity up-hill work,—and we are fain to remember the grand scale on which all things are done in that country to enable us to lift ourselves up to the height of its conceptions. We attain to the proper calature of mind by remembering that it is a country which takes down Niagara at its pleasure, and builds it up again as though it were a house of cards,—breeds horses that run against the lightning, and give it no chance,—and sweeps the heavens for a new star to mark the advent of a favourite singer. It seems a small thing in such a land that one gentleman—in Iowa—proposes to keep the cities “free from thunder-storms,” for so much a year. There is a scientific possibility here, which takes off the edge of the marvellous that we feel on first facing it as a practical measure. “What a gentleman in Iowa proposes to do for us,” says the *Lovell Courier*, “has already been done for the vine-growers of the south of France. By means of a well-arranged system of lightning-rods, a whole district has been rendered inaccessible to those destructive hail-storms which so frequently follow in the train of thunder-storms. What has been done in France can be done elsewhere. If we can teach lightning to write, we can surely teach it to behave itself.”—But another projector, whose name is appropriately Wise, is about to do a more remarkable thing. He proposes to take advantage of an air-current from west to east, and establish a line of Balloons between the United States and Europe. The difficulties of the project are met with a boldness which nothing turns back. Indeed, one little difficulty is, that the Balloon-train cannot turn back. The aerial locomotives cannot, of course, return by the same route:—but Mr. Wise thinks nothing of an obstacle like this,—they can go forward, and return to their starting-point by running clean round the world! The arrangements are so far advanced, that Mr. Wise has even settled the fares. “He undertakes,” says the *Builder*, “to circumnavigate the globe for 3,000 dollars each trip.” We do not conceive that the scheme will answer as a commercial speculation,—but it is a great one, and scientifically we wish it prosperity. Passengers will be timid,—and for a time at least afraid to bait at castles in the air. The project is somewhat inflated, too,—but inflation, we should think, in America, (and probably elsewhere,) is a condition of its success.—We are, however, more familiar with the sea tracks,—and it has often occurred to us to wonder that some enterprising American has not effected the passage of the Atlantic by relays of sea-serpents. All that is needed is, a bridle for Behemoth,—and we cannot doubt that Mr. Wise's science is equal to that. The scale of the thing is startling at first,—but will by degrees adapt itself to the public apprehension. A length of express like this would carry many, and travel quick. The serpents should wear blinkers as they approach the coast of Ireland, to prevent their pulling up to wink at “Mr. B., of Bandon,” if he should happen to be “out in his boat.”—Then, if the “gentleman in Iowa” can make an application of his apparatus for insurance “against thunder-storms” to these new American “Liners”—to distinguish them from the old, they might be called penny-a-“Liners,” after their express patrons,—we have a perfect, safe, and expedition system of water carriage. The Balloon stock will “go down”—because the Balloon scheme would not.

We have this week to record, on the authority of the Mayor of Liverpool, one of those acts which in their munificence have long characterized the merchant princes of England,—but which in the forms that they now assume are striking expressions of the great civilizing spirit that has come over the age, and of the important part that our great commercial towns may play in its advancement. Mr. William Brown, the Member for South Lancashire, has, according to Mr. Holme, the

Mayor, made an offer of 6,000*l.* as a gift to the town for the erection of a building for a public library.

It is reported from Brussels that a fresh attempt has been made by the ruler of France to bridle the free press of Belgium,—with the same result as before. Once again, then, the poetical fancy has failed in fact:—“the Empire has not had its old success.” Some months ago, as our readers will remember, Napoleon the Third refused to renew an important commercial treaty between the two countries because some of the Brussels newspapers called him Badinguet, Boustrapa, and other irreverent things,—while King Leopold objected to break the presses, and send the writers to Cayenne. The attempt at material coercion failed,—and the Belgian people have forfeited certain trade advantages rather than forego the right of free speech. M. de Morny, it is said, has been to Laeken to inform the King on what terms he may purchase the good will of the Tuileries;—and Leopold is reported to have replied somewhat roundly, that he was a constitutional ruler, and could not interfere with the independent action of the press so long as it kept within the law.—This reply will be a great satisfaction to those lovers of free thought who feared that, through the recent marriage, and the known opinion of some about the Court, Belgium was about to become Austrian once more.

We are informed that Mr. Thorpe, the editor of various Anglo-Saxon and other works connected with early Northern literature, is preparing for the press a new edition and translation of *Beowulf*, founded on a collation of the Cottonian MS. made more than twenty years ago, when it was in a less damaged condition than it is at present.

The Paris journals report the death of M. Ozanam, Professor in the Faculty of Letters in that city,—who as a learned man, a writer, and a teacher, leaves behind him a reputation not to be measured by the shortness of his career.

It is just twelve months since the Manchester Free Library was opened to the public; and as this is the first practical experiment in the system of free reading for all classes, the result is of some public interest. When Sir John Potter broached his idea,—an idea borrowed from without, but made his own by the completeness of its adoption and the zeal with which it was carried into effect,—many persons sneered at the proposal. They believed in the beer-house and the gin-palace,—but had no confidence in the power of good books, nor faith in the unknown desire to consult them. Even of those who gave their support, not a few did so from chivalric or Quixotic motives, rather than from earnest belief in great principles applicable to all classes alike from high to low. The result of one year's real experience is a great triumph. Nothing could be more satisfactory as a popular demonstration,—a calm, silent, unforced demonstration. Here are the figures. Deducting Sundays, and a short vacation, the Free Library has been open 300 days;—in which time there have been issued from the lending department 77,648 volumes, and from the reference department 61,488 volumes. The activity exhibited in these returns surpasses the largest expectation of the founders. Four hundred and sixty volumes a day given out to the toilers of Manchester:—here is the best and most complete answer to the men who talk of the poorer classes not caring for the quiet pleasures of intellect.—What, by the way, are the men of Marylebone about! Months ago their Library was announced to open on a certain day:—the day came in due course, but the Library was not opened; and since that time we have not heard the causes of the failure to keep faith with the public.—Neither do we find the men of Finsbury, Lambeth, Southwark, and Westminster so ardent in the same cause as could be wished. Is the example of Manchester to find no other than provincial followers? One year's experience at the Manchester Free Library proves that the lending department is that in which the drain is most active and uniform. Each book on the lending shelves has been read on the average thirteen times within the year. A striking fact this,—and one to show the corporation how desirable it is that they should

strengthen and enrich this part of their Library without delay.

COLOSSEUM, Regent's Park.—Admission 1s.—The original PANORAMA OF LONDON BY DAY is exhibited Daily from half-past Ten till Five. The extraordinary PANORAMA OF LONDON BY NIGHT, from Seven till Ten. Music from Two till Five, and during the evening, several favourite Songs by Miss A. Poole.

CYCLOPORA, Albany Street.—LISBON AND EARTHQUAKE.—This celebrated and unique Moving Panorama, representing the destruction of Lisbon by Earthquake in 1755, is exhibited Daily, at Three; Evening, at Eight o'clock.—Admission, 1s.; Children and Schools, half-price to either Exhibition.

ROYAL GALLERY OF ILLUSTRATION, 14, Regent Street.—ST. PETERSBURGH and CONSTANTINOPLE are exhibited immediately preceding the DIORAMA of the OCEAN MAIL (via the Cape to INDIA and AUSTRALIA).—Daily, at 3 and 8. Admission, 1s.; Stalls, 2s. 6d.; Reserved Seats, 3s.; Children, Half-price.

GOLD NUGGETS at the GREAT GLOBE.—A Large Collection of AUSTRALIAN GOLD, together with Rocks, Minerals, and Precious Stones of Australia, at Mr. WYLLIE'S LARGE MODEL of the EARTH, Leicester Square. Lectures hourly upon every subject. Geographical Societies. Open daily from 10 to 10. Children under 15 years of age and Schools, half-price.

PHOTOGRAPHIC INSTITUTION.—An EXHIBITION of PICTURES, by the most celebrated French, Italian, and English Photographers, embracing views of the principal countries and cities of Europe, is now OPEN. Admission 6d. A portrait taken by Mr. Gibson's process, from 1s. to 5s. extra copies for 10s.—Photographic Institution, 168, New Bond-street.

AZTEC LILLIPUTIANS' FAREWELL NIGHTS at the MARIONETTE THEATRE, LOWTHER ARCADE, Strand.—Decidedly the LAST SIX DAYS of the Exhibition of these Wonderful Beings. They sail for Dublin on the 30th of October, by Special Invitation to attend the closing of the Great Exhibition; their stay in London cannot, under these circumstances, be prolonged. Saturday, the 1st of October, is positively the Last Day.—Admission, One Shilling. Open, at 1, 3, 5 till 9, and 7 till 10.

ROYAL POLYTECHNIC INSTITUTION. PATRON:—H.R.H. PRINCE ALBERT.—THE SECOND PART of an HISTORICAL LECTURE, "THE TURKISH EMPIRE," from its Sources to its Extinction, by GEORGE BUCKLAND, Esq., assisted by Miss Blanche Younge, with NEW SONGS and NEW DISSOLVING SCENERY, on Tuesdays and Fridays at Four o'clock, and every Evening except Saturday at Nine.—Lectures: by J. H. Pepper, Esq., on PHOTOGRAPHY, with Illustrations, Mornings and Evenings.—By Dr. Bachofner, on ELECTRO-GILDING and SILVERING.—THE LANCASHIRE SEWING MACHINE exhibited in Use and explained Daily.—Open Mornings and Evenings. Admission, 1s.; Schools, and Children under Ten years of age, Half-price.

FINE ARTS

STATUE OF SIR ROBERT PEELE IN WESTMINSTER ABBEY.

A statue of Sir Robert Peel, cut out of a most beautiful block of stainless white marble, has just been quietly and unostentatiously erected in Westminster Abbey. No importunity of announcement preluded the coming of this new accession to the monumental population of this grand old Temple,—no flourish of trumpets attended the inauguration. The haunter of those majestic architectural avenues, ever resonant with choral memories—the accustomed reader of that grand stone missal, whose crowded legends are history—finds only that a new page has been added, without advertisement,—that a new statue stands conspicuously against a column at the corner of the north transept:—and wonders at the importance of the work compared with the silence which has attended its enshrinement. Secretly, as if shrinking under a shame of some kind from that marble immortality to which it is consigned, has the figure of the great statesman ascended the pedestal on which it is to stand as a representative to future generations of the man who gave to his political children "bread," and has here received from them in return—but in no grudging or ungrateful sense—"a stone." For, this is the monument voted by the nation, through its Parliamentary voice, to the memory of Sir Robert Peel.

We have spoken much lately—and have more to speak—on the subject of Art Competitions:—and with all their disadvantages—which we have shown to reside, not in the principle, but in the faults of its application—this work will go far to reinforce the argument in their favour. Competition has been in every way in the ascendant in the matter of these Peel Statues. All over the land the national heart insisted on this expression of its grief. A sort of competition was thus established between the great towns themselves as to who should have the best statue,—and each town

thought it safest to enter into the general competition by means of an individual competition in its own case. Well, Parliament voted 5,000*l.* for a national monument,—to stand in the City of Westminster, and take its place in the temple which holds the ashes and the effigies of England's illustrious dead. Of course, it was important that the metropolis should not be beaten by the provinces in this Art Competition,—that the monument reared by the whole nation should not fall behind the monuments severally reared by its constituent parts. The guarantees taken elsewhere might have been taken here, by the production of models and the empanelling of a competent jury for selection from amongst them. But Lord John Russell was Prime Minister,—and he chose, as our readers know, to look on this 5,000*l.* of the nation's as at his private disposal,—on this national commission as a piece of pocket patronage. Quietly and silently, behind the backs of all the sculptors in England, he handed over the work to Mr. Gibson—who went quietly and silently away to Rome, to execute it—and quietly and silently the statue has, at this late hour, ascended its pedestal in Westminster Abbey.

For Lord John Russell's own sake, we hope he is satisfied with the result:—but we are bound to tell him that the artists and critics of England are not. We have heard amongst them but one opinion of this work. A performance so poor in conception—so entirely surrendered to the old worn-out conventions—threadbare by use, even if their principle had not been utterly inapplicable to the age in which we live—we have not seen for many a day. Here stands Sir Robert Peel—*par excellence* the English statesman—sprung out of the very heart of the industrial population of England, and out of the Egypt of his greatness sending corn plentifully into the starving Canaan whence he came—here stands the familiar figure which pleaded night after night the people's cause, in the House of Commons—as nearly every man, woman and child of that people know—in a modern blue coat and white waistcoat—here it stands in that masquerade garment which is all tarnished and tattered with wear and tear—the garb of a Roman senator!—Then, the properties are as poorly used as they are poorly chosen. The question of ancient costume as applied to the statues of living men we have again and again discussed,—and our readers are so familiar with our views, that we need not repeat them here. But, supposing for a moment that Roman drapery were not condemnable as a mere commonplace, even though its principle might be defended,—the ground of defence—and it is put generally as an excuse rather than as an argument—is, the Art-facilities which it lends to sculpture by means of its rich and flowing outlines. If this anachronism is to be admitted—not on its own merits, but for the resource which it yields—it can be only on condition that that resource be finely used. If excuse be afterwards wanted for the manner of handling a quality which wanted excuse for itself to begin with,—then, we have a fault engrafted on a fault. If foreign drapery hung on English limbs be allowed for the sake of the aids which it lends to sculpture composition, then we have a right to demand that the folds shall be richly or grandly massed. Here, they are drawn into thin poor lines, and cling to the right limb like a tight-fitting garment. This is the more unfortunate, because the limb which they thus reveal would have gained greatly by being concealed:—we should have been glad of some rich falls of the toga over it.

No work can come from Mr. Gibson's hand which shall not present clever points,—and this has many. But besides the conventions of costume, there is poverty of thought in many other parts of the performance. The opportunity was a great one,—and it has been thrown away. The work is theatrical, and low theatrical,—melo-dramatic, and bad melo-drama. All this is the more unfortunate because of the solemn character of the place in which it stands, and of all that surrounds it. It has the ill luck to be contrasted close at hand with a work by Mr. Behnes, the statue of Sir William Follet, which, if the eye travels no lower than the waist—we wish the legs were under a domino—rebukes it in the fine and noble simplicity of its

character and action. Here, are no hackneyed phrases and no theatrical clap-traps. The man "in his armour as he lived" is here,—free, easy, natural. Then, right opposite the Gibson Peel stands the noblest work in the Abbey—Flaxman's monument to Lord Mansfield:—for which great work the sculptor received, we believe, the sum of 1,300*l.*,—while Gibson for his Peel has 5,000*l.* In the Mansfield work, it is true, that Flaxman had the use of drapery; but there, it is legitimately used—for the Judge is in his robes. And, how is it used! Turn from its grand masses, and look at the Peel petticoat!—Thus, by a strange enough casualty, Mr. Gibson's work stands in a neighbourhood which taunts it at once with an example of the manner in which drapery may be pictorially used, and an example of the manner in which it may be artistically dispensed with.

FINE-ART GOSSIP.—Some additional stone statues, from the workshop of Mr. Thomas, have been added to the new Palace at Westminster. The figures are meant to represent the persons of Henry the Second, Edward the First and his Queen Eleanor, Eleanor Queen of Henry the Third, Isabella Queen of Edward the Second, Edward the Third and his Queen Philippa, Richard the Second, and Henry the Fourth. They are placed in recesses of the central hall or octagon.

The Department of Science and Art at the Board of Trade have issued the following notice to artists in reference to the forthcoming Exhibition in Paris.—"The Board of Trade has received information from the Secretary for Foreign Affairs stating that the French Ambassador has communicated to him that a universal Exhibition of the Fine Arts is to take place at Paris, in May, 1855, at the same time as the Exhibition of Industry. The French Government expresses a desire that this Exhibition may be as complete as possible, and that its organization may be arranged in a manner to give satisfaction to every nation invited to assist in it. The artists' works will be forwarded gratuitously to Paris, and the arrangement of them will not entail any expense on the artists exhibiting. Information of further arrangements will be afforded as soon as they are made. Henry Cole, Lyon Playfair, Joint Secretaries."

MUSIC AND THE DRAMA

DRURY LANE.—A new play, by the Author of 'Calaynos,' Mr. George H. Boker, was produced on Monday. It has been acted in the United States,—and is entitled 'The Betrothal.' It is in five acts; but the plot is exceedingly meagre, and most inefficiently developed. The dialogue has here and there a pretty piece of boarding-school poetry,—common-place enough, but pleading for temporary suspension of censure, though not of sufficient merit to justify an ultimate verdict in favour of the piece. The language is generally flowery; but at intervals interrupted by a colloquial line, thrown in by way of contrast, and having an odd effect. The scenes, indeed, abounded in such small artifices; but they were not of a nature to compensate for the want of dramatic art in the structure of the whole. In story and in character the piece is of a composite order,—owing something to Shakespeare and Massinger, and something to Goethe. The heroine, *Costanzi* (Miss Anderton), is wandering in a garden with her cousin, *Filippa* (Miss Featherstone),—when they are accosted by two cavaliers—*Count Juriano* (Mr. Belton) and *Salvatore* (Mr. Davenport). The cavaliers proceed to perambulate the walks with them,—and come forward with their alternate wooings, like Faust and Mephistopheles with Margaret and Martha. *Costanzi*, however, is under a difficulty:—she is betrothed to one *Marsio*, a wealthy but old and ugly usurer (Mr. G. Brooke). *Marsio* is a disagreeable compound of Shylock, Overreach, Luke, and the Hunchback, who desires to associate his wealth with rank:—*Costanzi* being the daughter of the *Marquis di Tibuzzi* (Mr. Evans), whose decayed fortunes leave him a prey to the schemes of the rich

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and ambitious merchant. With these schemes the appearance of the Count and his friend somewhat interferes,—and Marsio's jealousy and suspicion are aroused. In consequence, he takes virulently active measures,—plunging at once to a solution, coarsely accusing his betrothed to her father, and ultimately confronting both ladies with their lovers. Convinced at length of his own unsafe position, he confides to his servant, Pulti (Mr. A. Younge), the office of mixing poison with the wine of the young gallant at the bridal festivity. But Pulti, who enacts in the piece a kind of part blended of Marcell and Launcelot Gobbo, has already clandestinely engaged himself as Salvatore's servant, and communicates the intended treachery to his second master. A punishment for the intending poisoner is counterplotted:—in the moment of his supposed triumph, Marsio is made to believe that he has himself, by an exchange of cups, partaken of the poisoned cup,—and he goes through the agonies of an apparent death. It turns out, however, that Salvatore has only dosed him with an opiate and some drastic drug,—from the effects of which he would wake in the morning as a felon in a gaol.—Such is the strange catastrophe:—a desperate attempt at a happy solution with tragic accessories. Mr. Brooke played the character, and this incident in particular, in a seriously earnest spirit,—which seemed utterly unconscious that the author was jesting equally with the actor and with the audience. He had previously found few opportunities for effect,—and it was hard indeed that in this great situation the tables should be turned upon him, and the entire sum of his death-agonies have to be entered on the wrong side of the account. Such, however, was the inartificial catastrophe of a series of scenes called a drama,—but as deficient in action, progress, interest, and every truly dramatic element, as in originality. There was scarcely any applause until the conclusion; when the actors were called for, and a demonstration was attempted,—but it was generally felt that success had not been attained. Bouquets, however, were thrown upon the stage;—one to Mr. Brooke, and three to Mr. Davenport.—The new play was advertised for three nights, but was withdrawn on Wednesday:—‘Hamlet’ being substituted. American dramas, like American poetry, have, it would thus appear, the unpardonable sin of imitation to answer for,—and cannot succeed on the English stage until their authors shall have learned to draw from their own sources of interest, and from the fund of character and description supplied by American manners and American scenery.

MUSICAL AND DRAMATIC GOSSIP.—*Gossip from Paris.*—Whatever Napoleon the Third may fail to do for the arts, it is certain that his Government has caused gold, eagles, and capital N's to be lavished with Australian richness and glitter on the interior decoration of the *Grand Opéra*. The re-opening of this theatre a few evenings since threw the French capital into an excitement curious among a people who have known so many and such grave revolutions. Sooth to say, the gold seems more remarkable than the good taste with which it has been used,—the other predominant colour employed being a dark lurid red, which neither harmonizes with, nor relieves such an amount of dazzling splendour. One present effect of the glare before the curtain is, the inevitable dinginess of the brightest display that could be made on the stage. This amounted on the opening night to a discrepancy little short of the ridiculous; and ‘Les Huguenots,’ with its well-worn scenery and dresses, looked as dim, dowdy, and dirty a pageant as should not have been presented on a like occasion. The chronicler must go on to declare, that the musical execution bore a discouraging harmony in tone to the dresses and decorations.—What our stage performances have gained under Signor Costa, those of the *Grand Opéra* (once so incomparable) have lost under M. Girard. Slackness, spiritlessness, want of sonority, were not of old to be complained of at the *Académie*; but the orchestra there is now weaker and more toneless than it should be,—while the chorus on the occasion in question, though augmented, while it was numerous, sounded small, dead, and husky.

Of the principal singers it would be unfair to complain; since, with the exception perhaps of the two basses, MM. Obin and Merly, they are avowedly second rate:—but the general dragging languor of their execution, made their insufficiency doubly visible.—A new opera, in two acts, by M. Limnander, is to be produced pretty speedily:—and shortly afterwards MM. Scribe and Gounod's ‘Nonne Sanglante,’ a grand five-act work, the music of which is understood to be completed.

The opening of the third opera-house in Paris, the *Théâtre Lyrique*, for the season has taken place,—the new work chosen being ‘La Moissonneuse,’ with music by M. Vogel. This gentleman, who has heretofore enjoyed a certain reputation as a composer of romances, is, we believe, the grand-nephew of the well-known composer of ‘Demophon.’

The comicalities of France in regard to English products and English affairs are like the poetry of earth “which ceaseth never.” Every now and then a fashion breaks out analogous to that which so confounded Lady Morgan, when—on entering a confectioner's shop in search of the newest French pastry—she was assailed with muffins and crumpets. Thus, it seems droll in the *Champs Elysées* to see a new *Eldorado* coffee-garden, recommended not merely by the flush of petunias, geraniums, asters, and other autumn flowers at its gate, such as we could not keep clean in London for any given four-and-twenty hours,—but by the flaunting promise, in gold letters “as high as a house,” of ENGLISH BEER.—The following paragraph, too, which has gone the round of certain journals, is more curious in another way,—as having excited speculation and inquiry and belief among French musical people:—

“There is a project in London of building a magnificent theatre, with the view of giving there concerts and ballets. To judge from the plans put forth, it will take its place among the public ornaments of London—it is to be grand in architecture,—and the interior decorations splendid. This building, situated in the finest quarter of London, will bear the name of the *Choregraphical Concert Theatre*. The founder of this gigantic establishment, M. Alp. Ruin de l'Yé, has got together a capital of 100,000 sterling. The shares are already distributed among the highest class of English society. M. Alp. Ruin de l'Yé has already engaged M. Bartholomew, the experienced choregraphist, for three years, as ballet-master, at a salary of 2,000 sterling per annum. The opening of the *Choregraphical Concert Theatre* is fixed for the first of April next.”

—It seems, then, that we are to have an English *Eldorado* elsewhere than in the Elysian Fields of Paris,—and with ballets, not beer, as its bait!—but the tale is probably a mere *poison d'Avril*, made out of nothing, and cooked à l'Américaine.

The periodical from which the above stirring promise is derived, also mentions the appearance of a wonderful new *contralto* singer, a Mdle. Arva, by birth Hungarian,—who is said to be exciting a great sensation at Frankfort.

There are certain paragraphs in the foreign musical journals which are as frequent as the publication in the English papers of the origin of the “pawnbrokers' three blue balls” so whimsically commemorated by Charles Lamb. Among these, is some new notice of the progress in Art made by that imperious and wandering Lady Madame Stoltz. Among these, too, are some new letters from Signor Rossini,—who appears to entertain no objection to having his correspondence hawked about in the journals. This time, the two are united in one:—and the composer of ‘Guillaume Tell’ vouches for the remarkable perfection attained by the *ci-devant* Queen of the *Grand Opéra* in Paris,—in terms which would justifiably put all the managers of Europe on the alert, had they not, unhappily, too large an experience already of Rossinian testimonials.

It is absolutely the fact, that another person wishing “to make his life uneasy” (as the rhyme runs) has been found willing to venture on that desperate adventure, the leaseholdship of the *Italian Opéra* at Paris:—and that this individual is no other than Col. Ragani, the husband of the lady well known in her day as Madame Grassini, and uncle by marriage to Madame Grisi.

TWENTY-THIRD MEETING OF THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

SECTION A.—MATHEMATICAL AND PHYSICAL SCIENCE.

FRIDAY.

‘On the Action of the Winds which veer from the South-West to West, and North-West to North,’ by Mr. R. RUSSELL.—In almost all the violent storms which occur in the British islands, the currents above seldom coincide with those at the surface of the ground, which statement also often applies to ordinary weather, when there is little atmospheric disturbance. On previous occasions, Mr. Russell had endeavoured to show that many of the phenomena of our storms would ultimately be explained by the mutual action of the under and upper currents. He had never seen an instance of a British storm that admitted of being explained on the rotatory theory, and he thought this theory altogether erroneous as applied to our high latitudes. A south-east current in the upper regions of the atmosphere seldom occurred in Britain, but south-east surface winds were common in moist and rainy tracts of weather. In these circumstances, however, an upper current of S.W. overlies the S.E., and supplies it with rain. Direct E. winds, prevailing not only at the surface, but at those atmospheric heights where the cirrus clouds are formed, are much more common than from the S.E., and undivided currents from the N.E. are still more frequent. A west wind seldom or never blows below when an east wind prevails above; but on the contrary, it is very common for a S.W. current to prevail above, when a N.E., E., or S.E. wind may blow furiously below. The solution of many of the primary phenomena of those storms which commence in Britain with easterly winds and terminate with westerly or northerly winds, is to be found in the mutual action of the upper and lower currents moving in different directions, and not in the principle of rotation. A current from the N.W. at the surface of the earth never blows for any length of time with an upper current from the S.W.; but in certain tracts of weather, it is very common for a S.W. under-current to prevail, while a N.W. or N. wind is blowing above. It has been noticed that gales begin to blow from the S.W. or S., and afterwards veer round by W. with great violence to N.W. or N. The advocates of the rotatory hypothesis find a solution of this by supposing that at those places where the wind veers from S.W. by W. to N.W., a vast body of air is in a state of gyration from right to left, and in a state of translation from S.W. to N.E. The centre of rotation is supposed to lie far to the north of the stations where the wind goes through these points. This is a very plausible explanation of the veerings, and is always adduced in support of the rotatory hypothesis, in favour of which much may be said in one class of storms, but in these there can be no rotation, as the S.W. wind flows in one broad stream over the island, and no observations can be found to indicate a recurring of the S.W. wind. In the class of storms where the wind goes through the course of S.W., W., to N.W., an upper current from the N.W. prevails. The veering, he considered, may be accounted for in the same way as variations may be observed in the summer months, and which arise, he thought, from an intermixture and interchange which is effected along the course of the wind, the hot air rising up and the cold air descending. A similar phenomenon is to be seen in the commingling of water. This, too, he believed, affords a proximate explanation of many of our easterly gales; and so the reversal of the lower current by the heat of the sun during certain states of our atmosphere in summer is maintained by the constant ascent and descent of the air of the two opposite currents, so far as the south wind extends. Every gust of the breeze must be considered as the effect of vertical gyrations caused by air of different specific gravities. As soon as the sun lessens his heat, the disturbing influences are diminished, and at last night brings a calm at the earth's surface, while the north current above still flows on. The length of time which the wind will blow from the S.W. is very

uncertain. It commonly varies from 8 to 48 hours, and in some cases it continues for days. The wind at once turns round to the N.W., when the barometer again begins to rise. The cause of this change of wind to the N.W., he believed, is merely the upper current resuming its sway at the surface of the earth by putting the thin stratum of air which has been following from the S.W. into the same course as the current above. The temporary eruption of the S.W. wind, which has been heated over the warm ocean and replenished by moisture, appeared to him to be a parallel phenomenon to the southerly breezes which play over our island during the day in summer when the N. wind is prevailing. These dry breezes are daily called into action by the solar rays disturbing the equilibrium of the air in the lower depths of the atmosphere where rarefaction takes place. In this manner, then, may the moist S.W. winds from the Atlantic be hurried over the continent of Europe, and when once set in motion they possess a self-sustaining force in mingling with the dry cold current which overstratifies them. Although it may be against general theory and belief, he thought that the returning polar current in our latitude is much more frequently from the N.W. than from the N.E. Both Mr. Green and Mr. Mason were of opinion from their aeronautic experience that in whatever direction the wind might blow at the surface of the earth, at 10,000 feet the current was invariably from some point between N. and W. This opinion was no doubt carried too far, but it clearly showed the frequency of the N.W. wind above the lower currents. Many of the storms which begin to blow from the S.W. and veer round to N.W., are apparently caused by the mutual action of two currents from these quarters stratified over one another. In these storms, too, the barometer does not usually give much warning of their approach, indeed the mercury will sometimes be actually on the rise when cirro-stratus cloud, the precursor of the S.W. wind, is already formed along the western horizon. On the contrary, the storms which come on with easterly winds give notice of their approach by a fall in the mercury. In conclusion, Mr. Russell observed that the extraordinary change of the wind from S.W. to N.W. had been noticed, before it was investigated, by the poet Shakspeare, and he had some very beautiful lines on the subject, which Mr. Russell quoted.—An interesting discussion followed.

'Provisional Report on the Theory of Determinants,' by Prof. SYLVESTER.—Mr. Sylvester said, he trusted he might stand acquitted of any want of respect to the British Association in having failed to be ready with the Report which last year they did him the honour of confiding to him on the Theory of Determinants. A circumstance had occurred since the last Meeting which seemed to render such report less necessary or useful than at that time it appeared to be,—as he had been informed that a complete compendium of all the methods and results of this theory was shortly forthcoming from the hands of a fellow-countryman in the Journal of M. Crelle, which is accessible to the whole mathematical world. This and the pressure on his mind attendant upon multifarious occupations and numerous original researches might, he hoped, serve as a sufficient apology for his being unprepared with the report. The much vaster subject of Invariants, which includes the theory of Determinants as its simplest case, has at present no chronicler or editor; and if the Association would think it desirable that a summary of the progress so far made in it should be collected, and be not unwilling to commit to his charge the execution of it, he would have pleasure in accepting the task, provided the period for its completion were previously understood to be not necessarily limited to the period of a single year from the present time.

'On the Expression for the Quotients which appear in the Application of Sturm's Method to the Discovery of the Roots of an Equation,' by Prof. SYLVESTER.—This being a purely mathematical communication, no abstract could make it intelligible to general readers.

'A Communication from Lieut.-Gen. Sir John Burgoyne, Inspector-General of Fortifications,

regarding the Progress made in the Publication of the Trigonometrical Survey,' by Col. SARINE.—The labours of the Ordnance Survey Department have been directed during the past year to the determination, according to the theory of minimum squares, of the most probable corrections to be applied to the angles of the principal triangles. This process, which is a most laborious one, involving the solution of about 1,300 equations of condition, is now well advanced, and every exertion is being made to hasten its completion. Until it has been finally completed, the computations of distances cannot be properly undertaken, for it must be borne in mind, that the trigonometrical operations of the Ordnance Survey have not been limited to the measurement of solitary arcs of meridian, but embrace a connected triangulation, extending through the length and breadth of the United Kingdom, which must be considered as a whole in deducing the geodetic results to compare with the astronomical observations. Besides preparing for the publication of the Principal Triangulation, the Ordnance Survey Department are about to publish a volume of Levels in Ireland, and another of the Meteorological Observations made at the Ordnance Survey Office, near Dublin,—the printing of both works being at the present time in progress.

'Notice of several complete Concentric Irises seen from a Peak of Snowdon,' by Mr. W. GREY.—Mr. Grey had been ascending Snowdon, one evening in last June, and having got above the clouds he was suddenly surprised to see depicted on them on the opposite side from the sun three beautifully complete coloured rings, the centre of which appeared to him very dark violet. There was also a fourth but incomplete ring seen, the lower part of which appeared cut off by the shadow of the peak on which he stood. The order of the colours, which were very vivid, was the same in all the rings,—the red being innermost. The morning was cold, but the air even at that elevation was not frosty. Mr. Grey as soon as he descended the mountain, and while the impression was still vivid in his memory, had prepared a drawing of them,—which, with an enlarged copy, he now exhibited to the Section and explained.

'On the Angle to be given to Binocular Photographic Pictures for the Stereoscope,' by M. CLAUDET.—M. Claudet described in a very elaborate paper, and most minutely, the several circumstances which rendered the taking of binocular photographic pictures a very difficult task; pointing out the circumstance that, when the two cameras were so adjusted as to take one part of the picture correctly, the adjustments for other parts were improper. He pointed out the exaggerated effect produced on the appearance of length given by this circumstance to some members of the body, and greater depth or distance to others. He showed that the remedy used by painters for these difficulties of their art were not available to the photographer; and he explained the principles on which distance to him was of the utmost importance,—and how at the various distances which he could only command, he must adapt the distance of the cameras and the angle at which their visual lines were adjusted so as to produce the best possible picture. He exemplified his several assertions as he proceeded by exhibiting several very beautiful portraits and groups, adapted to the binocular stereoscope,—the effect of which was most pleasing and the illusion complete.

'On the Graduation of Standard Thermometers at the Kew Observatory,' by Mr. J. WELSH.—In the year 1851, the Committee of the Kew Observatory, impressed with the importance in meteorological investigations of possessing thermometers of a better class than those hitherto procurable from opticians, took steps with the view of producing such instruments under their own superintendence for distribution to institutions and individuals who might require accurate standards of reference. The Committee were furnished with the information necessary to carry out their intentions by M. Regnault of Paris, who had been accustomed to construct his own thermometers by a method proposed by himself, and with an accuracy previously unknown: they were also supplied under his directions with the requisite apparatus. It had

been assumed by physicists that at all temperatures, as high at least as that of boiling water, the apparent expansion of mercury in a glass envelope is uniform for equal increments of heat. A mercurial thermometer might therefore be called a standard instrument when the divisions of its scale corresponded everywhere to equal volumes of the contained fluid, and when the readings were known for the temperature of melting ice and of water boiling under a certain barometric pressure. If the tube were perfectly uniform in its bore, it would only be necessary to make a scale of equal parts between the freezing and boiling points, and to extend the division above and below these points,—but as perfect tubes were in practice not procurable, it became necessary in dividing the scale to make allowance for the variations in the tube's capacity. These variations could be obtained by carefully measuring a short column of mercury (an inch or less in length) as it is made to pass along the tube by successive steps, each of which is as nearly as possible its own length. In the thermometers constructed according to M. Regnault's process the divisions do not represent degrees of the ordinary scales of temperature, but are of an arbitrary value, differing for each instrument, and requiring separate tables for each thermometer to convert the scale readings into degrees,—the divisions at all parts of the scale being equivalent to equal volumes, although their length may vary very considerably. Mr. Welsh described a modification which he had made in M. Regnault's process, by which he was enabled to divide the scales of the thermometer graduated at Kew at once into degrees—the readings being afterwards subject only to the small errors of manipulation, and such errors as arise from the unavoidable changes which take place in the zero points of all thermometers. The freezing points were determined in the ordinary way by immersion in well-pounded ice, from which the water is drained off as it melts. The boiling points were determined by the apparatus devised by M. Regnault, in steam, whose elastic force is exactly equal to that of the atmosphere at the time,—a correction being made for the difference in the barometric pressure from the adopted standard pressure. The boiling points, besides being determined for the usual position of a thermometer—with the stem vertical,—were also observed in a similar apparatus with the stem in a horizontal position; so that if the instrument should ever be used in any other than the vertical position, the proper correction might be applied. The difference between the boiling point of a thermometer in the two positions was found to be from 0°·2 to 0°·5 Fahr. according to the thickness of the glass and the form of the bulb. After the graduation of a thermometer had been completed, its accuracy was examined by a subsequent calibration with a longer column of mercury. If the length of the column with reference to the scale divisions was everywhere the same, the graduation was considered good, but if any alteration was found to exist, a more complete examination was made by using columns of different lengths, each of which was nearly an aliquot part of the range of the scale,—the remaining errors being deduced from these measurements by the method adopted by Mr. Sheepshanks for the thermometers used in connexion with the national standard yard. It was, however, seldom that any appreciable correction was found to exist.—It had long been known that the freezing point of a thermometer is not constant, but rises by a considerable amount during the first year after its construction. There was, however, another peculiarity in the thermometers, which was less known. If a thermometer, after having been for some weeks exposed to the ordinary temperature of the air, were placed in melting ice its freezing point would be, for example, 32°·2; if the bulb were then put for two or three minutes into boiling water and soon afterwards again placed in ice, the reading would no longer be 32°·2, but would have fallen to nearly 32°·0; if in a day or two it were again placed in ice, the freezing point would have risen a little, about 0°·1; and if again tried after two or three weeks, the freezing point would be found to have acquired exactly the original position of 32°·2. This had been found to be the case with

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every thermometer examined at Kew, whatever was its age; the difference in the freezing point before and after boiling being about $0^{\circ}17$ Fahr., and varying inappreciably in different instruments. This peculiar displacement of the freezing point seemed to be owing to a temporary alteration in the dimensions of the bulb, caused by a considerable change of temperature; the glass, after having been expanded by heat, requiring a week or two to contract to its original size. It appeared, therefore, that the alteration in the freezing point of a thermometer depended upon two separate causes, the one being a slow contraction of the bulb continuing for many months, but ultimately ceasing; and the other being a temporary alteration in the dimensions of the bulb produced by a sudden and considerable elevation of temperature, which disappeared in two or three weeks. The rise in the freezing point of ordinary thermometers was probably due to a combination of both these causes; for if a thermometer had its freezing point set off soon after being blown and filled, there would be first of all, the comparatively rapid contraction of the bulb due to the great heat to which it had lately been exposed, and afterwards, the more gradual contraction which continues for several months. The author recommended opticians instead of "pointing off" their thermometer immediately after being filled, to allow them to rest for a month or six weeks, so as to avoid, at least, the first great change which occurs; but, of course, the longer they were kept the better. Mr. Welsh mentioned another fact which he had observed in thermometers. He took about fifteen thermometers, and after carefully ascertaining their freezing points, kept them exposed to the temperature of boiling water for about sixty hours, allowing them afterwards to cool very slowly. It was then found that the freezing point had been *permanently* raised in all of them by about $0^{\circ}3$ to $0^{\circ}4$ Fahr. The effect of a subsequent sudden elevation of temperature was exactly as before, to lower the freezing point by nearly $0^{\circ}2$; the reading which was found after the long-continued boiling being again restored in about a fortnight. He was not yet prepared to say whether any effect would be produced by the boiling in the way of bringing the freezing point of a newly-made thermometer to a permanent position, irrespective of the temporary alteration caused by a sudden elevation of temperature.

Dr. ANDREWS having been requested by the Vice President to give the Section the benefit of his experience in this practical field, — stated, that he had just described in the Chemical Section a very cheap, simple, and, he believed, effective instrument for performing the same office as the very beautiful, though expensive one so ably used at Kew by Mr. Welsh. The screw in his was but an inch and a half long, yet he could graduate scales of any length, and to a degree of accuracy which surprised even himself. However, as the description of the instrument would appear in the proceedings of another Section, he would not detain the Section further than to exhibit a thermometer whose scale had been graduated by it.

SATURDAY.

'Report of the Committee appointed at Belfast to inquire into the Physical Character of the Moon's Surface, as compared with that of the Earth,' by Prof. PHILLIPS. — 1. The Committee, having received their instructions in September, 1852, lost no time in assembling, by invitation of the Earl of Rosse, at Parsonstown, where, with the assistance of Col. Sabine, at that time President of the Association, they made preliminary examinations of the moon, by the powerful telescopes of the Earl of Rosse, and formed plans of further proceeding in conformity with the results of these examinations and the individual experience of the members of the Committee. 2. Taking as a general basis for the work to be done, the much valued maps and Treatise of Mädler and Beer, it appeared to the Committee desirable to procure a new set of drawings or surveys of selected parts of the lunar disc; to suggest certain conditions of representation, with reference to the illumination of those parts, and to propose a uniform scale for the drawings. The suggestions

offered, as some help to observers on this subject, were the following: — 1. For the acquisition of correct ideas regarding the form of any part of the lunar disc, an examination of it under at least three aspects appears indispensable. *a.* A little (one hour) after the sun rises on that part of the spherical surface; *b.* When the sun is on the meridian of that part; *c.* A little (one hour) before the sun sets upon it. By this arrangement each part of the surface may be delineated and described under three directions of incident sunlight, two of them (*a* and *c*) suited by long shadows to discover the inequalities of level, and the other (*b*) aiding by a vertical incidence to make apparent the unequal reflective powers and different colours which characterize the different lunar regions, and the systems of brilliant stripes which are connected with certain lunar forms. 2. The "age of the moon," when a drawing is made, should be stated to the second decimal of the day, because a knowledge of this epoch is essential to a right estimation of the angle of incident light under which the observations are made. Probably, the observer will find it convenient to prepare beforehand a table of the moon's age, corresponding to each hour of mean solar time. The mean solar time of the place at the beginning and end of each observation should also be stated. 3. Among the chief points to be attended to are—*a.* The steepness of slopes, which may perhaps be best determined by noting the time at which they began or ceased to be illuminated generally. *b.* In ring mountains the difference of level between their exterior and interior bases. *c.* The curvature of their interior, whether greater or less than that of the general surface; some of them are much raised in the centre, as is evident by the shadows which these parts throw. *d.* Whether the brilliant stripes are elevated above the ground where they pass, and the angle of illumination at which they disappear. *e.* Slopes, height, and breadth of the soft ridges in the Maria. *f.* External fragments round ring mountains. *g.* Relation between mass of wall and area of depression (*i. e.* would the wall fill up the hollow). Other suggestions—as to the methods of drawing and the scale to be observed, were made; and it was requested that the drawings and descriptions, which might be prepared in conformity with these suggestions, might be forwarded by post to Prof. Phillips. 3. The Committee next endeavoured, by circular, to obtain the co-operation of a limited number of gentlemen, whether in the British Islands or in foreign parts, who by their possession of instruments of adequate optical power, habits of astronomical observation, and available leisure, might be able and willing to undertake definite parts of the great task which they hoped to see accomplished. To these letters, the replies which have been received offer in general very satisfactory assurances of co-operation. In some cases useful additional suggestions and notices of interesting facts are added. In particular, the author of 'Der Mond,' besides assuring the Committee of a general desire to co-operate in their labours, states the degree in which, since his appointment to the Observatory at Dorpat, he has been able to extend his former observations on the "light streaks" of the moon, an object to which the Committee had ventured to specially direct his attention, and instances the distinction which he has already made between those "light spots" which vanish in lunar eclipses and those which remain visible, and even grow more distinct in the shadow, except when it is deepest. The Committee do not, however, feel it to be proper now to repeat the special views and limited progress of their members—beyond placing before the Association one drawing of the mountain Gassendi, on the scale proposed for the whole survey—made from a telescope mounted at York by one of their members.

This communication gave rise to a very animated discussion.

'On Photographs of the Moon,' by Prof. PHILLIPS.—The fascinating processes of Photography can perhaps be hardly ever more usefully applied than in fixing on metal, paper, or glass, pictures of objects which are known or supposed to be variable, the law or rate of such variation being put

as a problem to be determined. The moon, our friendly satellite, is exactly in the condition to require this kind of investigation, and if photography can ever succeed in portraying as much of the moon as the eye can see and discriminate, we shall be able to leave to future times monuments by which the secular changes of the moon's physical aspect may be determined. And if this be impracticable, if the utmost success of the photographer should only produce a picture of the larger features of the moon, this will be a gift of the highest value; since it will be a basis, an accurate and practical foundation, for the minutest details which, with such aid, the artist may confidently sketch. When, therefore, at the Belfast Meeting of the Association, the three-inch daguerreotype of the full moon, which had been taken by Prof. Bond, from the great achromatic of Cambridge, U.S., was shown to astronomers, their gratification was extreme. Humboldt possesses one of these curious light-pictures of the moon of two inches diameter, prepared by Mr. Whipple, of Boston, U.S., in which the so-called seas and annular mountains are clearly distinguished. ('Kosmos,' III. part ii. 362.) The Committee to whom the Association, at its Belfast Meeting, committed a survey of the physical aspect of the moon, were not negligent of this powerful aid to an accurate drawing. The great telescopes of Birr, which in regard to light, definition, and steadiness offered the greatest temptations to this trial, were at the disposal of the Committee, and to them and the genius of their noble owner we must probably look for photographs of the moon on the largest scale and with the deepest contrast of light and shade. But they are not yet mounted equatorially, and in the mean time I thought it useful to try the power of my own 6½-inch achromatic, the work of our excellent artist, Cooke, which is driven equatorially by very equable clock movement in the open air. Before my attempt was made, some trials were made by Mr. De la Rue and others, but I am not able to say what is the value of their results. Though prepared in some degree for this experiment in the commencement of this year, it was not till the middle of July that I was able to submit an excited collodion surface to the concentrated rays of the moon. On the 15th and 18th of July, with my friend Mr. Bates, I obtained the pictures now presented for consideration. They prove beyond a doubt that the research is of a useful and practicable kind, and, if I mistake not, will be followed by far better things. In the expectation that this will become a favourite object of inquiry among photographers, I solicit a few minutes' attention to some of the conditions of the problem, for without a right notion of the thing to be done, much disappointment will attend the trials. First, it must be remembered that, as moonlight is about 100,000 times weaker than sunlight, and only appears to us bright in consequence of the general darkness around, photographs can only be taken quickly by very sensitive surfaces. The moon's image in the telescope has not indeed really more actinic effect on the silver surface than some of the duller terrestrial objects which are slowly depicted in the camera. On a highly sensitive collodion, the feeblest radiants operating for the shortest time produces some effect; but firm impressions can only be had by the integration of these differential quantities. In the telescope which I employ, with a sideral focus eleven feet, the moon's diameter, as traced on the collodion, somewhat exceeds one inch and a quarter, and the aperture being 6½ inches, the light of the moon's image is augmented 6.25^2 or 26 times, as compared with the brightness of the object seen directly by the eye. The time required for this image to be firmly impressed does not exceed five minutes, when the moon has a maximum south declination, and an elevation of only 12° . I think it probable that when her declination is at a maximum to the north—and I employ the most sensitive collodion—she will draw her own likeness in my camera in one minute, with sufficient firmness for printing. In the great mirror of Lord Rosse, having a sideral focus of fifty-two feet, I saw a moon-image of extraordinary beauty, or rather magnificence, and

six inches across. The light on this image was $\frac{1}{10}$ of that on mine, so that the picture might probably be impressed on a collodion surface in one-fourth of the time required on mine,—or, in the same time as on mine, it would give a twice magnified image ($\sqrt{4}$),—viz.: a moon twelve inches across. I confidently believe that the master of this mighty engine will make it do its work. I now turn to a different view of the subject, which is however of fully equal importance,—viz., the nature of the movement by which the telescope must be made to follow the moon. The clock now usually employed with centrifugal balls I find quite equal to follow star, sun, or moon, by an easy variation of its rate. The moon's motion in her orbit is variable, but not so much variable as to require in a few minutes any differential rating of the clock set by trial to her mean rate for the hour. It must, however, be accurately set to this rate, for otherwise, in direct proportion to the magnifying power, will be the brush or indistinctness of every meridional outline, and the equatorial extension of every part of the picture by an angular quantity (m) expressing the clock error. The moon has never, at two succeeding moments of time, the same declination; and except about the epochs of greatest north and greatest south declination, her chance of declination is sensible in a few minutes. Except at these times, the change of her declination is sensible in the picture obtained by an exposure of even five minutes,—as may be seen in the photograph of the 15th of July, where the north and south edges are brushed; and the craters appear elongated in a meridional direction,—the western edge remaining quite sharp. This difficulty might be practically overcome by a piece of mechanism connected with the clock, giving to the telescope a slow motion in declination (+ or -) proportioned to the square of the number of hours from the nearest epoch of greatest north or greatest south declination. The image obtained by the photographer should not only be perfect, but must be taken on a surface quite fine and true, so as to bear magnifying by eye-glasses. In this particular, at present, only the silver plate and the collodion film on glass have claims to approbation. I am not able to report at present the possession of such perfect images as to bear any but very low magnifiers; but this imperfection of the images will probably diminish or vanish by further trials, or by the aid of more fortunate experimentalists. Supposing our photographic power to be raised so much as to copy on silver, glass, or paper all that the lens can show, what will be the picture presented under a magnifying eye-glass? Let us assume, in the case of Lord Rosse's telescope, a first image of twelve inches in diameter, and that it will bear magnifying eight times. This will be equivalent to ninety-six inches diameter for the moon,—and about $\frac{1}{3}$ of an inch for a mile. The Physical Maps of Yorkshire, which I now exhibit in comparison, are on nearly the same scale ($\frac{1}{3}$ of an inch to a mile); and if inspected at a distance of ten inches, will give a fair notion of the apparent magnitudes of objects on the moon on this condition, which nearly expresses a magnifying power of 1,000. It is obvious, therefore, that by such means we may have a record of the moon's physical aspect under every phase of illumination, under every condition of libration, nearly as we should see her at a distance of twenty-four miles through the earth's atmosphere. We should see and measure on the glass or the metal her mountains and valleys,—her coasts and cliffs,—her glens and precipices,—her glacial moraines, escars and sandbanks,—her craters of eruption, of upheaval, or explosion,—her lava streams, or the scattered heaps projected from the interior. We shall spy out the various actinic powers of the different parts of the surface, compare these with their obvious reflective powers, and thus come to some reasonable conjectures on the mysterious light streaks which radiate from some of her mountains. To what degree of minuteness shall we see the objects? This question has not been much considered with reference to photography or the kind of objects which the moon exhibits. If we assume that one minute of angle is a good general measure for the *visibility* of areas presented to the eye, and therefore that areas are

visible at a distance about 3,000 or 4,000 times as great as their diameters, an area in the moon, seven miles across, can be seen by the naked eye. Magnifying this 1,000 times, we may see an area on the moon $\frac{1}{1000}$ of a mile across, or 37 feet—the size of a house. But though a spot of such dimensions can be seen, it cannot be defined under such a power as square, circular, elliptical, or triangular. To be thus clearly defined, so as to be positively drawn or described, its diameter must be such as to subtend nearly $3'$ of angle; so that to be clearly defined to the naked eye, black spots on a white ground must have a diameter of about ($\frac{1}{1000}$ radius) = 20 miles; and under the magnifying power of 1,000, $\frac{20}{1000} = \frac{1}{50}$ of a mile = 105 feet. But this calculation applies to black spots not greatly varying in their diameters. As we have on the moon many cases of entirely different figures,—arched, or triangular shadows,—long streams of light and long stripes of darkness, I was much impressed while at Parsonstown with the minuteness of some of the "rillen,"—as the Germans call the narrow, deep, often winding clefts, such as those about Aristarchus, and the much finer ones on the north-east of the Mare Humorum, of which I offer drawings. On returning home I made some trials of the visibility of narrow spaces, as compared with square areas of the same breadth. The results, which are of a kind to encourage greatly our surveys of the moon, appear in the subjoined table, and indicate that black narrow spaces, not exceeding ten feet in width, are within the magnifying power of the great Rossian reflector. To what extent the *illuminating power* of the instrument is competent to define such shadows, or the mechanism which must be employed to follow them exactly, are points for experiment to settle. As far as the eye is concerned, Lord Rosse's mirror has light enough for a much higher power, but the eye is more sensitive than collodion.

Description of black area on white ground.	At how many diameters distance it was visible.	At how many diameters it was defined.
1. Square—One inch	3,000	1,200
2. Do. Half inch	3,240	1,200
3. Do. Quarter inch	4,500	1,200
4. Long space—One inch across .....	.....	Above 3,000
5. Do. Three-quarters of inch across .....	.....	Above 4,000, seen as long narrow spaces.
6. Do. Half of inch across .....	.....	Above 6,000, beyond the limits of my measured ground.
7. Do. Quarter of inch across .....	.....	12,000
8. Do. Eighth of inch across .....	.....	15,320

Hence it appears that *linear spaces* may be noted as such to ten times the minuteness with which spots can be well defined. The distinctness of very narrow "rillen" is thus accounted for.

'On Drawings of the Moon,' by J. NASMYTH.—These magnificent drawings of the moon, three in number, were exhibited and described in the absence of the author by Prof. Phillips. The first was a drawing of the moon's whole surface on a circle six feet in diameter. The two others were drawings on a still larger scale of two particular portions of the lunar mountains. They were executed in a very peculiar style, white on black ground, with shadows which, though not those which were actually to be seen at any particular age of the moon, yet conveyed a very clear conception of the relief and depressions of the several parts of the surface. Mr. Phillips described several of the ring mountains, mountain ranges, and other peculiarities of the surface as depicted upon them. In particular, he drew attention to long narrow bright lines like the meridional lines on a globe which in some places were seen to stretch across the entire disc. He stated the ingenious explanation of these given at a former meeting by Mr. Nasmyth, and the experiment by fracturing by heat a large plate of glass which he had devised to illustrate them. He stated, that others held them to be fissures filled up by metallic veins; but this opinion he considered untenable, as they were seen to traverse hill and valley, mountain and crater in nearly unbroken lines, and in some cases were only to be seen when the light from the sun fell in particular angles upon them. If he were to offer a

conjecture as to their origin, he would say that they originated in some peculiarity of the reflecting surface of the moon, by which the peculiarities of what lay below the surface were manifested.

Prof. STEVELLY said that this conjecture of Prof. Phillips received some confirmation from a very curious Chinese mirror which he had lately seen, and which was the property of Sir J. E. Tennent. It was copper, stamped with various figures in strong relief upon the back; among which a large bird, with a spot on its breast and its head turned back, was prominent. The front seemed to be tinned very uniformly and brightly and uniformly polished. When this mirror was held in the direct light of the sun, and the reflected light received on a sheet of white paper, the figures on the back were found to be depicted by the diversity of bright light and deep shade; the bird with its head turned back, and black spot on the breast, appearing a prominent and unmistakable object. And yet to look at the polished surface all seemed equally bright and uniformly polished.—Mr. VARLEY expressed sorrow that it should have been stated authoritatively that there were no collections of water upon the moon. His opinion was, that there were waters; and that some of the appearances could be explained only by the shadows of objects thrown on sheets of water.—Mr. HOPKINS thought it not improbable that we should soon be acquainted with the geology of the moon on a much grander and more extensive scale than we were yet of the earth. The distance of the moon from us, by which we were at once presented with one half of her surface, gave an advantage to those who studied lunar geology which terrestrials could not attain to. What would be the cost and labour and time that would be required for trigonometrical surveys which could compete, after all, in accuracy very badly with the trigonometrical surveys of the lunar surface which he had little doubt these photographic processes would soon put us in possession of? It was also a considerable advantage, that from our situation we were enabled to pass down into craters and cracks; and while, from any similar examination, we were shut out with regard to the earth. It was also his opinion, that many of the large and extensive fissures, and other extensive disturbances on the moon's surface, originated in causes identical with those which gave rise to some of the disturbances of the earth's crust; and that the study of these phenomena in the moon might lead to a reflex extension or correction of our geological knowledge with regard to the earth.—Mr. GROVE expressed his conviction that photographic delineations of the moon of extreme accuracy would after no great lapse of time be obtained, which would aid most materially in the study of the condition of the surface of that satellite and, perhaps, lead to a knowledge of the origin of many of the peculiarities. He also mentioned some precautions to be attended to by which the desired accuracy was more likely to be attained.

'On the Currents of the Indian Seas,' by Dr. BUIST.—He said that water in motion exercised two classes of agencies on the surface of our globe:—first, a destroying one, levelling and throwing down continents and mountains, transferring them to the depths of the ocean, either to be raised gradually by those mysterious elevations now in operation or upheaved by violent cataclysms such as seem so frequently to have burst asunder the crust of the earth;—and second, a destroying and reconstructing agency as in the case of the Gulf-stream, redressing the equilibrium which it had just before disturbed—transferring the heat of the torrid zone to mitigate the rigour of the northern, temperate and polar regions, and eating away the roots by which the icebergs would have remained for ever anchored, and so enabling them to transport themselves to cool the tepid waters of the tropical seas. With the first of these, which has been so fully treated of in the Geological Section, we at present have no concern; and it is to the second that attention is proposed to be directed. One cubic inch of water when invested with a sufficiency of heat, will form one cubic foot of steam—the water before its evaporation, and the vapour which it forms, being exactly of the same temperature, though in reality, in the process of

conversion, 1,700 degrees of heat have been absorbed or carried away from the vicinage, and rendered latent or imperceptible; this heat is returned in a sensible and perceptible form the moment the vapour is converted once more into water. The general fact is the same in the case of vapour carried off by dry air at any temperature that may be imagined, for down far below the freezing point evaporation proceeds uninterruptedly, or is raised into steam by artificial means. The air, heated and dried as it sweeps over the arid surface of the soil, drinks up by day myriads of tons of moisture from the sea—as much indeed as would, were no moisture restored to it, depress its whole surface at the rate of four feet annually over the surface of the globe. The quantity of heat thus converted from a sensible or perceptible to an insensible or latent state is almost incredible. The action equally goes on, and with the like results, over the surface of the earth as over that of the sea, where there is moisture to be withdrawn. But night and the seasons of the year come round and the surplus temperature thus withdrawn and stored away at the time it might have proved superfluous or inconvenient, is reserved, and rendered back as soon as it is required; and the cold of night and rigour of winter are modified by the heat given out at the point of condensation, by dew, rain, hail, and snow. There are, however, cases in which were the process of evaporation to go on without interruption and without limit, that order and regularity might be disturbed which it is the great object of the Creator apparently for an indefinite time to maintain, and in the arrangements for equalizing temperature the equilibrium of saltness be disturbed in certain portions of the sea, and that of moisture underground in the warmer regions of the earth. It is some 36 years ago since Sir John Leslie pointed out that the waters discharged by the rivers of southern Europe were not sufficient to supply the Mediterranean with store enough for vapour for the countries on its shores, and that the immense amount drawn off by the arid borders of northern Africa, which from Alexandria westward supplied not a single rivulet, required to be provided for by an inward current from the outer ocean through the Straits of Gibraltar. Founding apparently on this, Sir Charles Lyell, in his admirable work published in 1832, assumed the filling up of the Mediterranean with salt—and a doctrine about to be shown in conflict with a first law of hydrostatics which nothing can upset, is still retained amongst the dogmata of orthodox geology without anything whatever to support it. The error seems to have been fallen into from the assumption that the water at the surface of the sea would remain in its place exposed to the action of the sun until evaporated up to the point of saturation, and only begin to descend on being transformed into solid salt, in which condition it would remain of course accumulating in the recesses of the sea. In point of fact, however, the instant the upper stratum of a fluid becomes one atom lighter than that beneath, it inevitably begins to descend, all other portions following it according as additional gravity is acquired by them. So soon as this mass of brine grows high enough to run over the barrier of the inland sea, it must, as a matter of necessity, flow outwards to the external ocean, where no such brine existed, and mingle with the average of the sea. It is matter of easy demonstration, that without some such arrangement as this, the Red Sea must long ere now have been converted into one mass of salt; and its upper waters at all events being, on the other hand, known in reality to differ at present but little in saltness from those of the southern ocean. Here we have salt water flowing perpetually through the Straits of Babelmandeb to furnish supplies for a mass of vapour calculated, were the strait shut up, to lower the whole surface of the sea eight feet annually,—and even with the open strait, to add to its contents a proportionate quantity of salt. But an under-current of brine, which, from its gravity, seeks the bottom, flows out again to mingle with the waters of the great Arabian Sea, where, swept along by currents, and raised to the surface by tides and shoals, it is mingled by the waves through the other waters which yearly receive the enormous monsoon torrents the

Concan and the Ghauts supply, become diluted to the proper strength of sea water, and rendered uniform in their constitution, by the agitation of the storms which then prevail:—flowing back again from the coasts of India, where they are now in excess, to those of Africa, where they suffer from perpetual drainage, the same round of operations go on continually; and the sea, with all its estuaries and its inlets, retains the same limit, and nearly the same constitution, for unnumbered ages. Capt. Haines, in his survey of the Arabian seas, describes the perplexing currents betwixt the Straits of Babelmandeb and Cape Aden; strong bands of inshore currents 60 miles in breadth or so running in one direction, while similar bands of an outward current run in the opposite direction; and currents similarly turbulent and irregular are found at the mouth of the Persian Gulf. I have no doubt whatever that both may be explained on the principle so well laid down by Dr. Scoresby in reference to the Gulf-stream where the tropical current running northward meets and intermingles with the polar one running southward. Speculating on these matters some years since, I found that Mr. Maury, of the United States Observatory, had, from a totally different series of considerations, come to exactly the same conclusions as these I had arrived at. So eager was this distinguished observer to follow up the subject, that he afterwards offered a sum equivalent to 300*l.* annually for the collection of information at Bombay to enable him to construct for the Indian seas wind and current charts, similar to those he had constructed for the Northern Atlantic, and these, it is understood, are now in a state of great advancement. The money was respectfully declined; some Bombay merchants having undertaken to provide for his use, at their own charge, the information desired, conceiving that it was enough that British traders should receive from America a survey of the currents of the English seas in the East without at the same time accepting funds from a foreign state that the British Government had failed to provide. Such were looked on as the advantages likely to accrue from the labours of Mr. Maury, that an estimate was published showing that, assuming the statement of the Royal Society to be correct, maps and sailing directions for the Eastern seas, such as had been provided for the Northern Atlantic, would save to the ports of Calcutta, Madras, and Bombay from a quarter to half a million annually in freights.

‘On the Optical Phenomena and Crystallization of Tourmaline, Titanium, and Quartz within Mica, Amethyst and Topaz,’ by Sir D. BREWSTER.—The author, after stating that crystals of titanium within quartz had been long known and attended to, drew attention to the fact that regular crystals of tourmaline, titanium and quartz had been discovered by him within mica, amethyst and topaz. That in some instances these crystals had been found grouped in very regular figures, and that the groups of crystals were sometimes distributed over what were obviously surfaces of inner crystalline forms of exactly the same shape as the entire crystal, from which the author drew inferences as to the original growing of the crystal. He also entered into an examination of some of the optical peculiarities of these crystals.

‘On the Production of Crystalline Structure in Crystallized Powders by Compression and Traction,’ by Sir D. BREWSTER.—The author had found that by pressing certain crystalline powders against slips of glass, sometimes smooth, sometimes roughened by grinding, with the clean broad blade of a knife or spatula, and drawing it along, he could give to the mass of powder thus treated the same polarizing action on light possessed by large crystals of the same kind; and which could be given to annealed glass and other non-crystalline substances by mechanical compression; but which they lost when relieved from the compressing force. The author then gave an enumeration of the crystalline powders in which he had succeeded by this compression and traction in producing this polarizing structure,—distinguishing those in which the glass over which they were so distributed required to be rough, from those in which it might be used smooth. He also enumerated the powders which he had tried,

but in which he had not succeeded in producing the same effect.

‘On a Proposed Barometric Pendulum, for the Registration of the Mean Atmospheric Pressure during long Periods of Time,’ by W. J. M. RANKINE.—The author proposes to use the variations of the rate of a clock to determine the mean barometric pressure during long periods. For this purpose the clock should be regulated by a centrifugal or revolving pendulum, part of which should consist of a syphon barometer. The rising and falling of the mercury would affect the rate of the clock; so that from the number of revolutions of the pendulum in a given time might be deduced approximately the mean height of the mercurial column during that period. The author investigates the formulæ to be used for this purpose, and points out the nature and mode of determination of the corrections required, for temperature, obliquity of the barometer, and centrifugal force and also for the difference between the square root of the mean of the squares of the barometric heights, which is the quantity ascertained in the first instance, and the mean of the heights, which is the quantity sought.

Mr. WELSH remarked, that considering the perfection to which self-registering barometers had been brought, and the ease and regularity of the system of reduction employed, he considered that the ingenious author of this communication would greatly waste his energies in attempting to construct this barometric clock.—Prof. STEVELLY stated, that in one of the clocks in the Armagh Observatory a barometer was connected with the pendulum for the exactly opposite purpose of correcting that part of the irregularity of its motion due to the varying resistance of the air.

‘General View of an Oscillatory Theory of Light,’ by W. J. M. RANKINE.—The author endeavours, while retaining the whole of the mathematical forms of the undulatory theory of light, to render the physical hypothesis which serves as its basis more consistent with itself and with the known properties of matter. Light, according to the undulatory theory in its most general sense, consists in the propagation of some species of motion amongst the particles of the luminiferous medium, the nature and magnitude of which motion are functions of the direction and length of certain lines transverse to the direction of propagation. According to the existing hypothesis of vibrations, this motion is a vibration of the atoms of the luminiferous medium in a plane transverse to the direction of propagation. In order to transmit motions of this kind, the parts of the luminiferous medium must resist compression and distortion like those of an elastic solid body; its transverse elasticity being great enough to transmit one of the most powerful kinds of physical energy with a speed in comparison with which that of the swiftest planets of our system is appreciable, but no more, and its longitudinal elasticity immensely greater,—both these elasticities being at the same time so weak as to offer no perceptible resistance to the motion of the planets and other visible bodies. The author considers that it is impossible to admit this hypothesis as a physical reality. He also points out the difficulties arising from certain inconsistencies in the present theory, as to the relation of the direction of vibration in polarized light to the plane of polarization. The author then proposes what he calls the *hypothesis of oscillations*, which consists mainly in conceiving that the luminiferous medium consists of detached atoms or nuclei distributed throughout all space, more or less loaded with atmospheres of ordinary matter, and endowed with a species of *polarity*, in virtue of which three orthogonal axes in each atom tend to place themselves parallel respectively to the three corresponding axes in every other atom; and that plane-polarized light consists in a small oscillatory movement of each atom round an axis transverse to the direction of propagation and perpendicular to the plane of polarization. The square of the velocity of propagation of such a movement would be proportional directly to a co-efficient depending on the rotative force or polarity of the particles in a given space, and inversely to a co-efficient denoting the sum of the moments of inertia

of the luminiferous atoms in a given space together, with their loads of atmosphere, round the axes of oscillation. The author shows that it is necessary to suppose that the co-efficient of polarity for transverse axes of oscillation is the same in all substances, and for all directions; and that the variations in the velocity of light depend wholly on the variations of the moments of inertia of the luminiferous atoms with their loads, in different substances, and round different axes. The co-efficient of polarity for longitudinal axes of oscillation must be supposed to be very great compared with that for transverse axes. How powerful soever the polarity may be, which is here ascribed to the luminiferous atoms, it is a species of force which must necessarily be wholly destitute of effect in producing resistance to compression or distortion, so that it is no longer necessary to suppose the luminiferous medium to have the properties of an elastic solid. The author deduces from this hypothesis the known mathematical laws of the wave-surface, of the intensity and phase of reflected and refracted light, and its plane, circular, and elliptic polarization, and of all other phenomena to which the existing theory has been applied, the equations being identical in form.

SECTION B.—CHEMICAL SCIENCE.

'On the Determination of the available Amount of Chlorine contained in the Hypochlorites,' by Dr. ASTLEY PRICE.

'On the Spontaneous Decomposition of Xyloidine,' by Dr. GLADSTONE.—This was a description of the changes that had taken place in a specimen of xyloidine, made by treating arrow root with nitric acid of specific gravity 1.5. After remaining about six years unaltered, this specimen suddenly began to give gases, and in a few weeks time nothing remained of the original xyloidine, but, in its place a light brown viscid liquid.

'On the Decomposition of Water under Pressure by the Galvanic Battery,' by J. P. GASSIOT.—The paper detailed a series of experiments which entirely confirmed the law laid down by Prof. Faraday.

MONDAY.

'A New Method for Determining the Commercial Value of Oxide of Manganese,' by Dr. A. PRICE.

'On the Conduction of Electricity by Flame and Gases,' by W. R. GROVE.—A somewhat extended series of researches have been recently carried out by M. Edmond Becquerel with a view to determine the conducting power of flame and of hot air. These investigations have led M. E. Becquerel to conceive that he has proved the conducting power of both for electricity. The apparatus employed—a platinum tube, with the conducting wire passing through it—appearing to offer some sources of error, Mr. Grove has adopted a somewhat different arrangement. This consisted of a glass tube, with two copper wires inserted through corks at either end; from these within the tube proceeded a piece of platinum wire, which, by connexion with the battery, could be brought to a state of intense ignition. In this state these were adjusted at the distance of 1.50th of an inch apart, and then connected with the powerful voltaic combination of Mr. Gassiot. Notwithstanding the proximity of the wires, no trace of electricity could be detected as passing through the interposed stratum of heated air, thereby proving the non-conductibility of the gases while hot. The conducting power of flame has been already satisfactorily proved.

'Notice of Changes in Wood obtained from the Submerged Forest at Wawne, Holderness,' by T. J. PEARSELL.—From time to time considerable masses of wood have been dug up from the district of Holderness. Specimens of these being deposited in the Philosophical Institution at Hull, some peculiar changes were observed to occur,—amongst others, the escape of a gas of a very pungent odour, and eventually crystals, of some hydro-carbon compound, of a large size, were discovered to have formed.

Mr. LOWE made some remarks on the analogous slow combustion of coal giving rise to a similar strongly acid vapour, and on the formation of crystals of the same general character in other bodies.—Dr. PRICE instanced the formation of

these crystals in cedar.—A desultory conversation arose on the probable age of the submerged forest at Wawne, in which it was elicited that although its age could not be determined, yet that the fact of its submergence in the autumn was evident, since the nuts of the beech and the hazel were found with the wood. That the submergence has also taken place since the existence of man in these islands was shown by the discovery of a copper-plate, of an exceedingly good manufacture, and remarkable as having been mended by rivetting in a very careful and particularly neat manner.

'Notice of peculiarly formed Substances called Lime Flowers from the Brickwork of the Reservoirs of the Hull Waterworks before they were completed for Use,' by T. J. PEARSELL.—The cement upon which the brickwork of the reservoir 'the Hull Waterworks was laid being imperfect, and never setting, there were produced upon one side only of the reservoir some remarkable forms. These partook, in many respects, of the conditions of organization; long stems were formed, and in most of them a bulb was produced, which, opening, resembled a half-opened tulip, or the flower of the crocus. These stems and bulbs varied in length from 2 or 3 to 15 or 18 inches; they were arranged along between the joints of the bricks, and extending along for 200 or 300 feet. Analysis proved these lime flowers to be nearly pure carbonate of lime, and they were doubtless formed by the gradual forcing out of the lime into the water of the reservoir, where it combined with the carbonic acid. The causes which determined these very singular forms were not easily ascertained; but as all the stems were hollow, it is not improbable that air was forced up through the solid substance, and to the same cause may be attributed the flower-like top.

Numerous examples of these curious bodies were exhibited by Mr. PEARSELL, and a long discussion ensued, in which Dr. DAUBENY, Prof. ANDREWS, Mr. HOPKINS, and Dr. PRICE took part.

'Note on the Formation of Magnesian Limestone,' by J. T. JOHNSTON.—The author produced specimens of magnesian limestone formed by deposition from a spring near the village of Neesham, on the northern bank of the Tees. This limestone possessed the colour, general appearance, and porous structure of the limestones of the county of Durham, and contained as much magnesia as some of the purer beds of magnesian limestone in that county. From the production of this limestone he reasoned as to the deposition of dolomitic limestones in general, and the relative probability of the two theories which ascribe their magnesia to the impregnation of previously existing limestones, either by sublimation from beneath or by percolation from above. He considered both agencies inadmissible as general causes, and was favourable to the view that, as a general rule, magnesian limestones were deposited from aqueous solution, though occasional impregnation of previously existing rocks by percolation was by no means unlikely.

'On the Corrosion of Iron-built Ships by Sugar Cargoes,' by Dr. GLADSTONE.—The author stated that his attention had been drawn by his brother, Mr. George Gladstone, to the fact, that the owners of iron-built vessels object to sugar cargoes, on account of the rusting of the metal by the saccharine juices that exude from the casks; and this had led to a chemical examination of the re-action then instituted. It was found that when pieces of iron were placed in bottles containing a solution of cane sugar, the metal at the edge of the liquid soon became deeply corroded, but that which was permanently immersed in the fluid remained bright for a considerable time. The solution soon gave indications of the presence of protoxide of iron, which absorbing oxygen from the atmosphere was speedily thrown down as the red sesqui-oxide, leaving the sugar free to dissolve a fresh quantity of iron, the precipitated oxide in the mean time forming a deposit. After eighteen months, the liquid was of a deep red-brown colour; it became pale blue with ferrocyanide of potassium, black with sulphuret of ammonium; alkalis produced no precipitate; nitric acid peroxidized it. A portion dried and analyzed gave 20.78 parts of metallic

oxide to 100 of combined sugar, which is almost exactly in the proportion expressed by the formula $C_{12}H_{11}O_{11}$, FeO. The author, however, considered that this might differ from the true composition by one equivalent of water. No such iron compound could be formed by direct combination. In vain was it attempted to dissolve any freshly-precipitated and well-washed oxide of iron in a solution of sugar; and almost equally unsuccessful was the attempt to do so when the oxide was liberated by means of potash in the presence of sugar itself. It was found that under all circumstances of dilution or quality of the sugar solution, iron was attacked; the presence of zinc in contact with the iron did not prevent its being acted upon; nor was there any marked difference when the salts of sea-water, or the nitrates, sulphates, or chlorides of the alkalis were added to the solution. No other ordinary metal was found to be so easily acted upon as iron. Copper was very little affected by the sugar. Lead was slowly attacked, indications of the presence of its oxide in solution being obtained after three days' exposure. Tin appeared to give the binocide. Zinc was little affected when alone; it seemed to be dissolved more quickly when in contact with iron. It is doubtful whether mercury was touched by the sugar solution; silver certainly was not. The author regretted that his experiments did not suggest any method by which the corrosion of iron ships by sugar cargoes might be prevented. They showed rather the strong disposition to combine that there is between the two substances; and how a small quantity of sugar may eat continuously into a large sheet of iron. The attention of chemists was especially drawn to the fact that the iron enters into combination with the organic matter not when it has already been oxidized, but only when in a metallic condition, rendering the action, as would be imagined, more complicated.

FRIDAY.

SECTION C.—GEOLOGY.

'On the Classification and Nomenclature of the Palaeozoic Rocks of Great Britain,' by Prof. SEDGWICK.—The Professor stated that the fossiliferous rocks formed in reality only one great system, representing the whole succession of events from the first appearance of organic life to the present day. But as it was convenient to divide History into chapters, so the strata had been divided into three principal series,—the Palaeozoic or Primary, the Secondary, and the Tertiary, each characterized by many families, genera and species of peculiar fossils. The Palaeozoic strata might be again divided into an upper, middle, and lower series: the first including the Permian and Carboniferous systems, the second the Devonian or Old Red Sandstone, and the third the Silurian and Cambrian systems. These rocks were characterized generally by the entire absence of Mammalia, and even of reptiles in their lower division; and by the presence of peculiar groups of shells (*Orthocera* and *Goniatites*), crustaceans (*Trilobites*), and corals (*e. g. Graptolites*). Very few specific forms ranged from one division of this system to another; but they had great general resemblance. A few corals ranged from the Bala limestone to the Devonian, and one (*Favosites Gothlandia*) even to the lower beds of carboniferous limestone; *Terebratulina reticularis* was found in the Silurian and Devonian; and *Leptaena depressa* from the Bala limestone to the Carboniferous. Prof. Sedgwick then called attention to the grounds for separating the Cambrian and Silurian systems, which he said he had always maintained to be distinct. He had commenced his observations in the Cumberland hills, of which a section was exhibited, showing the following succession of rocks:—1. Skiddaw, slate, usually without fossils, but containing *graptolites* in one locality; 2. Conistone limestone, abounding in fossils; 3. Conistone flagstone and grit. The order of succession of the beds above these was difficult of determination in the lake district. He had next investigated the structure of North Wales, between the Menai and the Berwyns, and had established the existence of a great system of rocks comparable to those of the lake district, and had given to them the name of the Cambrian system.

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Meanwhile, Sir R. Murchison had discovered in "Siluria" tracts exhibiting the whole upper series, equivalent to the beds above the Coniston grit. And having made good sections of the strata in ascending series, from the Llandeilo flags to the Old Red Sandstone, and given names to these rocks which were now generally adopted, this country had become the type to which all others were referred for comparison, because in it the order of succession was clearly made out. It then became a question what was the boundary line between the Cambrian and Silurian systems? Sir R. Murchison had made the Llandeilo flags the base of his system, and considered the whole country westward of it to be Cambrian. It proved, however, that the rocks to the west of the Llandeilo valley were newer, and not older than the flags; that in fact the Llandeilo flags were not above the Cambrian system, but an integral part of it. But, instead of adding the narrow belt of country occupied by these flags to the Cambrian system, Sir R. Murchison had wished to convert the whole breadth of the Cambrian region into Silurian.—Prof. Sedgwick then referred to the section of the Malvern strata, as determined by Prof. Phillips; he contended that the Caradoc sandstone and conglomerate of this section belonged in reality to the Wenlock series, and proposed for it the name of "May-hill sandstone." The underlying black shales and "Holly-bush sandstone" of Prof. Phillips he regarded as the true Caradoc sandstone, belonging to the Cambrian system. Prof. Sedgwick further endeavoured to show by sections and lists of fossils, that the Silurian May-hill sandstone existed in a distinct form in the typical district of the Caradoc sandstone. With this correction the Cambrian system would include the Lower Silurian of Sir R. Murchison. The distinctness of the Cambrian or Lower Silurian from the Upper Silurian was admitted on fossil evidence; Mr. Barrande had found only 6 per cent. of fossils common to the two systems in Bohemia, and Mr. Hall only 5 per cent. in America. In Westmoreland the per-centage was only 3½. Of 324 species in the Cambridge Museum, not 15 per cent. were common to the two systems, including all the doubtful cases, and the real number was probably not above 5 per cent. Prof. Sedgwick then read a letter from Prof. Rogers in America, expressing his approval of this nomenclature, and his conviction that it would eventually be adopted; he also entered upon an explanation of the manner in which his various papers on this subject had been published in the *Journal of the Geological Society*, as it had been supposed that he himself had abandoned the term *Cambrian* at one time, whereas the alteration had been made in his paper by a former President (Mr. Warburton) of the Society without his knowledge.

Mr. HOPKINS, late President of the Geological Society, explained some of the circumstances referred to by Prof. Sedgwick, and expressed a strong conviction that the Professor would succeed in establishing his nomenclature. Setting aside all personal claims, and looking solely at the merits of the case, he believed that the proportion of distinct species in the Cambrian and Silurian systems would prove to be as great as in other parallel cases.—Prof. PHILLIPS stated, that it was more than thirty years since he first met Prof. Sedgwick on one of his geological excursions; and after so many years of labour, he was gratified to see that he had obtained a form of sound classification of the oldest fossiliferous rocks of the British Isles. He believed that if Sir R. Murchison were present, he would put aside all points of difference, and also congratulate him on having presented so good a view of the subject. As the development of our types was looked upon as the pattern for other countries, it would be unfortunate if we allowed it to be supposed that there was no basis for our classification, whereas no difference of opinion existed as to the main facts, viz. that the Cambrian rocks contained a large series of characteristic forms of life, and that the Silurian also contained a distinct series; the question was, where to draw the line between them. A classification taken from the Malvern country alone would be incomplete, as regarded both the series of strata and the forms of life. It was extremely difficult to apply

the doctrine of the succession of life on the globe to minute cases, since the sets of fossils from adjacent quarries might differ, being determined by local circumstances. The term "system" of rocks as now employed had no such distinct character as when it was first used by Mr. Conybeare, whose systems were distinguished by conformity and mineral character, as well as by fossils. He wished not to express a positive opinion, or to adopt arrangements which he regarded only as provisional; there had arisen before him a vision of a classification founded entirely on the succession of life, and he looked forward to the time when the nomenclature should express, not the local mineral changes, but those phenomena of organic life which extended over much wider areas.—Mr. STRICKLAND argued, that there had been no period at which organic life was absent from the globe, and no such thing as an entirely new creation, but that the changes in organic life had all been gradual. He did not think that even zoological terms would be universally applicable any more than that the same species would be found everywhere at the same time. The nomenclature must ever remain to a certain extent arbitrary and conventional. The value of the Cambrian and Silurian systems was not to be determined by the per-centage of identical species so much as by the zoological affinities of the genera and large groups of fossils, and in this respect they were apparently more allied than the Silurian was with the Devonian, or the Devonian with the Carboniferous system.

'On some Ayrshire Fossils,' by WYVILLE THOMSON, LL.D.—Dr. Thomson exhibited a collection of fossils from the Lower Silurian (or Cambrian) rocks on the south bank of Girvan Water, in Ayrshire; they were obtained by breaking up the rock, and still retained their natural surfaces in very great perfection, whereas fossils of the old rocks in general only retain their real surfaces when developed by the weather.

Prof. HARKNESS stated that these fossils belonged to the age of the Llandeilo flags, and were more recent than the great mass of rocks to the south—extending from the Mull of Cantire to St. Abb's Head,—which were 30,000 feet in thickness.

'On Refracted Lines of Cleavage, seen in the Slate Rocks of Ballyrizza, in the County of Cork,' by R. W. TOWNSEND.—The author exhibited a diagram representing the surface of some Devonian rocks near Cork, in which the angle of the cleavage planes changed slightly on passing from the argillaceous layers to those of a more arenaceous character.—[The subject had been fully described by Prof. Phillips, and discussed at the Meeting of the British Association at Cork in 1843.]

Mr. STRICKLAND called attention to an article, by Mr. Sorby, in the *Edinburgh Philosophical Journal*, 'On the Cause of Slaty Cleavage,' which he regarded as a mechanical structure, produced by pressure during the elevation of the masses which it affected.—Prof. SEDGWICK stated, that this view had also been advocated by Mr. Sharpe, but he believed it to be unsatisfactory; the cleavage planes were not always "nearly perpendicular," as stated by Mr. Strickland; there were large tracts in South Wales where they were nearly horizontal. Neither were they the necessary results of pressure, for in regions which had been subjected to enormous pressure the rocks were unaffected by cleavage planes. He believed them to have been caused by a molecular change in the rocks after their elevation and solidification.

'On the Cornbrash of Gloucestershire and part of Wilts,' by Prof. BUCKMAN.—This stratum was described as not more than 8 feet in thickness, but covering a considerable horizontal area. The relative productiveness of soils on the cornbrash to those on the "stonebrash" was represented to be as follows.—

	Inf. Oolite.	Great Oolite.	Cornbrash.
Wheat.....	15	20	25
Barley.....	25	30	40
Oats.....	25	36	45

Analyses of the rocks themselves, made by Dr. Voelcker, show that the cornbrash is richer in two important elements, viz., sulphate of lime and phosphoric acid.—

	Inf. Oolite.	Great Oolite.	Cornbrash.
Carbonate of lime ..	89.20	95.346	89.195
Magnesia	34	739	771
Sulphate of lime ..	09	294	241
Oxide of iron	414	1422	2978
Alumina	06	194	177
Phosphoric acid ..	275	1016	1231
Soluble silica	3.27	333	4.887
Insoluble sand		not determined.	
Alkaline salts			
	99.95	99.384	99.420

The cornbrash frequently abounds in fossils; out of sixty-five species collected, more than half were bivalve shells. The author expressed his opinion that certain oolitic Terebratulæ (viz., *T. digona*, *obovata*, *lagenatis*, *ornithocephala*) should be considered as forming only one species,—at the same time admitting that these forms characterized particular strata and localities. He also pointed out that nearly half the bivalves, and six out of eight sea-urchins, were identical with species found also in the inferior oolite, but not in the intervening great oolite.

MONDAY.

'On a Chemical Cause of Change in the Composition of Rocks,' by Prof. JOHNSTON.—The first example of a chemically altered rock adduced by the Professor, was the rotten-stone of Derbyshire,—a light and porous substance used chiefly for polishing metals, and stated in Phillips's 'Mineralogy' to be composed of silica, alumina, and carbon. It is obtained from a ridge known as the Great Fin, on the right-hand side of the road from Bakerswell to Buxton. This ridge is covered with "drift" 10 or 20 feet thick, consisting of brown clay, with manes of black marble, chert, and rotten-stone. The rotten-stone is so soft whilst in the soil that the spade goes through it readily, but it hardens on exposure; the holes from which it is dug are sometimes only 2 feet deep, at others from 6 to 8 feet. On examining a series of specimens, Prof. Johnston found that whilst some were homogeneous, others had a nucleus of black marble; he then treated specimens of the black marble with weak acid, and found that on the removal of the carbonate of lime, there remained from 15 to 20 per cent. of a siliceous substance perfectly like the natural rotten-stone. He concluded that there existed in the soil some acid which penetrated it and dissolved out the calcareous matter of the rocks below. The agent in this case might be the carbonic acid of the air, brought down by rain; but there were instances not capable of explanation by this agency alone, and attributable to other acids, which are produced under certain conditions and exercise a much wider influence. The bottoms of peat bogs present very strong evidence of the action of acids, the stone and clay are bleached and corroded, only siliceous and colourless materials being left. The source of the acid is here the same as in the former instance; the vegetable matter growing on the surface produces in its decay acid substances which exert a chemical action on the subsoil, and escape by subterranean outlets, carrying away the materials dissolved in their progress. Another instance was afforded by the mineral Pigotite, formed in the caves of Cornwall by water dripping from the roof; this water contains a peculiar organic acid, derived from the soil of the moors, which dissolves the alumina of the granite and combines with it. The organic acids are very numerous and different in composition, but agree in producing chemical action upon rocks. They are produced over the entire surface of the earth, especially over uncultivated tracts, and are the means provided by nature to dissolve the mineral food of plants; they are also amongst the chief causes of the exhaustion of soils. The author then alluded to Prof. Way's examination of some of the green-sand strata of Surrey, known as *firestone*,—a light and porous rock, containing silica in a soluble state. It was well known that common sandstone, quartz, or rock crystal were not acted upon by potash or soda at ordinary temperatures; but of the firestone 30 per cent., and sometimes 50 or 70 per cent., may be dissolved. In all such cases the silica must have been originally in a state of chemical combination with lime, alumina, or something else, which has been subsequently removed. The silica in the *rotten-stone* was soluble, but he had never met with instances

of black marble in a bedded state converted into rotten-stone. He believed, however, that a similar cause, operating over a wide area, and during a long period, had produced the altered condition of the freestone.—Prof. Johnston then alluded to the nodules of phosphate of lime in the greensand and crag, and suggested that the phosphorus had been derived from animal remains in higher strata, dissolved out by acids, and redeposited at a lower level. The last example was the *fire-clay* of the coal measures, a stratum almost universally found beneath beds of coal. It differs from the other clays both in colour and composition, being whiter, and containing less of those substances which acid bodies could dissolve, viz., the earthy bases, which would render the clay fusible in fire; the condition of the fire-clay might be accounted for by the action of acids developed during the production of the vegetable matter now forming coal.

The MAYOR of HULL stated that better rotten-stone was obtained from the Vale of Neath, near Swansea, where coal-measure limestone also occurred; it had also been found in Sligo. Rotten-stone was worth 12*l.* a ton, and he would support any attempt to produce it artificially. To constitute a good article it must be free from grit.—Prof. SEDGWICK stated that geological rotten-stone, unfit for use, was common, and afforded a good illustration of the action described by Prof. Johnston. He recommended that it should be sought for beneath the "dirt-bed" of the Isle of Portland, and wherever ancient deposits of vegetable soil occurred. Fire-clays were not always found under beds of coal; they were absent from many, probably from all, that had been formed of drifted materials carried out to sea.

'On the most Remarkable Cases of Unconformity among the Strata of Yorkshire,' by Prof. PHILLIPS.

'On the Dispersion of Erratic Rocks at higher Levels than their Parent Rock in Yorkshire,' by Prof. PHILLIPS.—The Professor stated that in a comparatively modern geological period, every part of Yorkshire below the level of 1,500 feet, was covered by the waters of a glacial sea. Icebergs appear to have floated over the whole of this district, depositing where they melted or overturned, the materials brought from the higher hills. Amongst these were blocks of stone from Cumberland and the West Riding, now found perched on the limestone hills. Some of them must have come over the Pass of Stainmoor, a height of 1,440 feet; others, on the Feizer, occupied a position rather higher than any at which the parent rock occurred. At Ribbles, there were large blocks near the summit, 150 or 200 feet above the level of the rock from which they were derived. At Long Scar, blocks of limestone lay on the hills over their source. These erratic blocks were not much water-worn, and must have been transported by ice, no violent rush of water would have accomplished it. He believed the glacial movement to have been one of Continental elevation and depression, occupying a long period of time.

Mr. J. SMITH referred to the presence of Arctic shells in the basin of the Clyde, still occupying the natural position in which they lived and died, and owing their preservation to the overlying boulder clay; here were proofs both of the glacial climate, and the depression of the sea-bed to a great depth, by which the shallow water and littoral shells were buried beneath an Arctic drift.—Prof. SEDGWICK stated that the depression of large regions beneath the sea might produce great changes of climate, and he believed these movements might be explained by existing causes, but not operating at their present speed. He did not think that the elevation of the Eastern Alps, within the period of the existing races of animals, was produced by movements like those now taking place on the coasts of Sweden and South America.

'On a new Plesiosaurus in the York Museum,' by Prof. PHILLIPS.—It was a curious circumstance that each of the three great Plesiosaurs lately discovered in Yorkshire belonged to distinct and undescribed species. One of these, described by Mr. Charlesworth at a former meeting, was now in the possession of Sir P. Crampton, in Ireland; the other two were in the York Museum. One of them was 18 feet long, and had a very small head; the

other was equal in size to the largest Plesiosaurus of the Kimmeridge Clay. Its head is 42 inches long, and much narrower in proportion than in the other species; the neck is much shorter, being only half as long, in proportion, as in the *P. dolichoceros*. The paddles are five feet in length. The vertebrae are like those of the other species; the teeth slightly different. It was found in Lord Zetland's works, at Lofthouse, on the Yorkshire coast.

'On a singular Fault in the Southern Termination of the Warwickshire Coal-field,' by Mr. TWAMLEY.—This narrow coal-field is described as extending from Polesworth, near Tamworth, to Sow, three miles east of Coventry. At the Victoria Colliery, near Bedworth, the coal-seams lie nearly together, with very thin partings, and measure from 8 to 10 yards. At Polesworth the seams are widely separated, forming, with the interposed strata, a thickness of more than 70 yards. The fault described is in the Victoria Colliery; the coal lies at the depth of 225 yards, dipping S.W. 12 inches in the yard. In driving a gate-road southerly a fault occurred, the coal-seams being cut off in succession by an upthrow to the south of rocky shale. The road was continued on a level for about 120 yards, when the coal-seams were again met with, in the same order in which they disappeared, and having nearly the same dip—viz., 20 inches in the yard. The interval in the ironstone band at the top of the coal was 180 yards; in the bottom coal 120 yards. The level at which the coal reappears is 22 yards higher than it would have been but for the fault. A headway was driven 60 yards, and a shaft sunk 40 yards in the shale, without finding a trace of coal. The fault has an irregular N.W. and S.E. course, at right angles to the dip of the beds.

TUESDAY.

'On the Production of Gold in the British Isles,' by J. CALVERT.—We have already reported the substance of this paper as read on Thursday in Section E.

'Some Observations on the Interior of the Australian Continent,' by J. CALVERT.—The writer stated his belief that as there was a great range of hills on the eastern side of Australia, there must also be another great granitic range on the N.W. He had made an expedition into the interior, which he had ascertained to consist of great salt plains considerably depressed below the level of the sea. In the S.E. of Australia he had observed two sets of boulders: one series, derived from distant snowy ranges, consisted of hard masses of granite, with scratched surfaces, were dispersed over the plains to the south-east; the other set consisted of masses, not transported, but bouldered by the action of the weather, which caused large hemispherical layers to shell off, some of them capable of holding water.

'On the curious Spiral Body in certain Fossil Sponges, and a notice of several remarkable Fossils from the Yorkshire Strata,' by Mr. CHARLESWORTH.—Mr. Charlesworth exhibited a diagram of a specimen of *Choanites Köniigi*, described by Mr. Cunningham at a former meeting of the British Association, (and reported in the *Athenæum*); and stated that he had formerly doubted the correctness of Mr. Cunningham's account, but now agreed with him that the spiral body was an essential part of the sponge. The remarkable fossils were an *Inoceramus* from the chalk, and a coprolitic-looking substance from the lias.

Mr. H. E. STRICKLAND exhibited a recent British sponge, which commonly exhibits a spiral cavity, but from a totally different cause. The sponge grows on a spiral shell inhabited by the hermit-crab, and continues to enlarge much beyond the shell; the crab also grows, and having a tendency to develop obliquely, produces a spiral cavity in the sponge.

'On the Formation of Boulders,' by the Rev. T. RANKIN.—The writer's observations were made in some of the valleys on the Scotch borders, with the view to disprove Mr. Hopkins's theory, and to explain the phenomena of the boulder formation by the general Deluge, and subsequent river-action.

'On Pseudomorphous Crystals in New Red Sandstone,' by H. E. STRICKLAND.—These pseudocrystals were cubical projections from the under surfaces of laminae of white sandstone, of the age

of the red marls, and had been detected at various localities in Gloucestershire, Nottinghamshire, and Cheshire. They might have been formed in cavities left by the decomposition of iron pyrites, or by the removal of crystals of common salt. That the latter was really the case seemed evident from some of the specimens, in which the faces of the cubes were concave, and exhibited concentric lines. The author inferred that the crystals of salt were formed on, or in, the mud of the shore, during a temporary exposure to the sun, and being again covered by the sea, the crystals had dissolved, and their form assumed by the material of the next succeeding deposit.

MONDAY.

SECTION D.—ZOOLOGY AND BOTANY, INCLUDING PHYSIOLOGY.

'On a curious Exemplification of Instinct in Birds,' by the Rev. F. F. STATHAM.—The author commenced by stating that his communication partook more of the nature of an anecdote than of any elaborate disquisition,—but that he apprehended that a great portion of the science of Natural History consisted in the careful collation of such anecdotes, with the inferences to which they naturally led. He made some references to the theory of the facial angle, as indicative of the amount of sagacity observable in the animal race,—but expressed his conviction that this theory was utterly at fault in the case of birds: many of those having a very acute facial angle being considerably more intelligent than others having scarcely any facial angle at all. Size also seemed to present another anomaly between the two races of beasts and birds—for while the elephant and the horse were among the most distinguished of quadrupeds for sagacity and instinct, the larger birds seemed scarcely comparable to the smaller ones in the possession of these attributes. The writer instanced this by comparing the ostrich and the goose with the wren, the robin, the canary, the pigeon, and the crow; and made some amusing allusions to the holding of parliaments or convocations by birds of the last species, while the ostrich is characterized in Scripture as the type of folly. The author then proceeded to describe in detail the particular case of instinct which formed the burden of his paper. It referred to the poisoning of two young blackbirds by the parent birds when they found that they could neither liberate them nor permanently share their captivity. The two fledglings had been taken from a blackbird's nest in the garden of S. Swinnell, Esq., of Surrey Square, London, and had been placed in a room overlooking the garden, in a wicker cage. For some time the old birds attended to their wants, visited them regularly, and fed them with appropriate food; but at last, getting wearied of the task, or despairing of effecting their liberation, they appeared to have poisoned them. They were both found suddenly dead one morning shortly after having been seen in good health; and on opening their bodies, a small leaf—supposed to be that of *Solanum nigrum*—was found in the stomach of each. The old birds immediately deserted the spot, as though aware of the nefarious deed befitting their name.

The reading of this paper led to the notice of several instances of instinct amongst animals.—Dr. HORNER stated that rooks built in the Infirmary trees at Hull, but never over the street. One year a young couple ventured to build over the street, and for eight mornings in succession the older rooks proceeded to destroy the nest, when at last the young ones chose a more fitting place.—Mr. A. STRICKLAND, after referring to the tendency of birds to build their nests of materials of a colour resembling that around their nests, related an instance in which the fly-catcher had built in a red-brick wall, and used for the nest mahogany shavings. He also referred to the meetings of rooks for judicial purposes. He had once seen a rook tried in this way, and ultimately killed by the rest.—Dr. REDFERN drew attention to the distinction to be made between instinct, intelligence, and reason. Instinctive actions were dependent on the nerves, intelligence on the brain, but that which constituted the peculiar qualities of the mind of man had no material organ.—Mr. ALLIS stated,

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that in proportion as the brain was developed in relation to their size in birds, was their intelligence. Thus, the goose and ostrich had small brains,—but the canary and wren very large ones.

'On the Mode of Growth of *Halichondria suberea*,' by H. E. STRICKLAND.—This species of sponge, which is frequently obtained by dredging, has long been known for the peculiarity of its habitat. It is found investing the surface of old dead univalve shells, which often present the appearance of being actually converted into, or replaced by, the substance of the sponge. For we find that the spiral cavity of the shell is continued through the sponge for a considerable number of volutions, and is always inhabited by some species of hermit crab. This has been explained by Dr. Johnstone, in his 'History of British Sponges,' who supposes that the sponge by some means dissolves, or absorbs, the larger volutions of the shell, and only leaves a small portion of the apical volutions undestroyed. On carefully examining some specimens which I lately dredged up, I found reason to believe that the sponge does not, as supposed, remove any portion of the original shell, but merely prolongs its spiral volutions beyond their original extent. It is true, that the enveloped portion of shell is often corroded and imperfect; but this is owing to its having been in a dead and decayed condition before the sponge began to grow. For in other cases the shell is sound, full-sized, and with a perfect mouth; and yet the spiral cavity is continued beyond it for several volutions, through the substance of the sponge. In a specimen now produced is a perfect shell of the *Nassa macula*, a small species of univalve; and yet the sponge has grown to such an extent as to suggest the idea of having been modelled on the much larger species, *Nassa reticulata*. The continuation of the spiral cavity through the sponge is evidently due to the presence of the hermit crab, round whose spiral body the sponge continues to grow, beyond the margin of the original shell. On first noticing this peculiarity, it occurred to me that it might throw light on the very remarkable spiral tube, filled with flint, which perforates certain fossil sponges from the chalk, as described by Mr. Charlesworth in the Geological Society. It appears, however, that the tubes in the fossil sponges do not taper, like those which in the recent sponge are modelled on the continually enlarging body of the hermit crab, and consequently the nature of the former structure still remains to be explained.

Dr. LANKESTER read the 'Report of the Committee for the Registration of the Periodic Phenomena in Plants and Animals.'—Registration papers filled up had been received from M. Moggeridge, Swansea; Miss Llewellyn, Llangwylach, Glamorganshire; G. H. M. Sladen, Nisfield, W. C. Nourse, Clapham; W. C. Donville, Santry, Co. Dublin, Ireland. These papers would be published probably in the next volume of the Transactions of the Association. In connection with the registration of the phenomena of life, as affected by changes in the weather, &c., Dr. Lankester called attention to an effort that was now making to register the occurrence of disease in conjunction with the state of the weather.

Mr. MILNER stated that season seemed to have an influence on the weight of man. He had weighed the prisoners in Hull gaol for five years, and had found that they regularly increased in weight from April to November, and decreased in weight from November to March. The diet was the same all the year round, as was also the temperature.—Dr. FOWLER pointed out the importance of warm clothing and fresh air to longevity. He was now eighty-eight years old, and attributed his vigour to clothing himself warm and sleeping with his bed-room window open.—The CHAIRMAN drew attention to the importance of using trustworthy instruments in all observations on the state of the weather.

'On the Influence of the Circulation on the Mental Functions,' by Dr. FOWLER.

'On the Physiological Action of Inorganic Substances introduced directly into the Blood,' by Dr. J. BLAKE.—The paper detailed a continuation of

the author's experiments on this subject. The salts employed in this series of experiments were those of alumina and iron, where the same result followed the action of the medicine was regulated by the isomorphism of the substances administered.

'Additional Observations on a New System of Classifying Plants,' by B. CLARKE.—The system had been published in 'The Annals of Natural History,' and these were additional notes.

Dr. WALKER-ARNOTT objected to the author's employing the position of the ovule as a fundamental distinction, as it was well known that in many orders and even in the same plant these positions differed.

'Exhibition of British Lichens, containing Dyeing Lichens,' by Prof. BALFOUR.—They were collected and prepared by Dr. Lindsay, and consisted of specimens of *Rocella tinctoria*, *R. fusiformis*, *Lecanora tartarea*, *Scyphophorus pycnidatus*, and *Cenomyces rangiferina*. Prof. Balfour also exhibited specimens of *Polypodium alpestre*, which he stated was common in the Scotch highlands, although only recently pointed out as a British plant by H. C. Watson, Esq.

Mr. GOULD, in relation to the colouring matter of the lichens, stated that the colour of the eggs of birds, especially those of humming birds, was frequently obtained by the lichens they used in building their nests. In answer to a question as to whether any of the lichens existed in sufficient quantities in this country to render it desirable to employ persons for the purpose of collecting them, Dr. WALKER-ARNOTT stated that he did not think any of the species were sufficiently abundant.

FRIDAY.

SECTION E.—GEOGRAPHY AND ETHNOLOGY.

'An Inquiry into the Variations of Climate within the Tropics, in Connexion with the Vertical Action of the Sun and the actual Motion of the Earth, especially with Reference to the Climate of the Gulf of Carpentaria, in North Australia,' by TRELAWNY SAUNDERS.—The prevailing opinion on tropical climates regarded the whole area within the tropics as equally objectionable to European constitutions. But the evidence of Capt. Stokes and others on the climate in the Gulf of Carpentaria proved that the range of the thermometer in that region rendered it peculiarly congenial to the human constitution. The thermometer had been observed at 50°, the air cold and bracing, and the effect on health, under great deprivations, had been proved to be excellent. It was a fundamental idea, in regard to the distribution of temperature, that it graduated from a line adjacent to the equator towards the poles. He would show that the relative duration of the sun's vertical action within the tropics produced five distinct zones, presenting characteristic and distinguishing features. The passage of the sun's vertical action between the tropics described a continuous spiral line on the earth's surface. In passing over the 3½° adjacent to each tropic, the sun was vertical within that extent of latitude for sixty-three successive days. He was vertical for only one-sixth of that time over the same extent of latitude in any other part of his course. The result was, a band of deserts under each tropic around the earth, with exceptions which arise only from preponderating local causes. He was vertical for thirty-five days between the parallels of 10° and 20° in passing to the tropic, and after the interval of sixty-two days already mentioned, he again passed vertically over the same latitudes in thirty-four days. After leaving 10° on the passage towards the adjacent tropic, he did not return to it again until 130 days had transpired, within which period he had been twice vertical beyond the latitude of 10°. But when he left 10° on his passage across the equator, the more distant tropic, he did not return to 10° again until 240 days had passed away. He did not return to either tropic until 365 days had elapsed. The excessive heat under the tropics arose from the long continuation of his vertical action, while he was over them. His absence from the equator never exceeded one and five days, and for that period only he left it to go to Cancer and back. In passing to Capricorn and back, he occupied only 130 days.

This difference was suggestive. Now, for the result. The two extreme torrid regions under the tropics had been already noticed. The equatorial region is characterized by constant warmth and excessive humidity, producing exuberant vegetation and animal life in abundant varieties. The regions between it and the torrid deserts, from which the vertical sun was absent for a lengthened period, present the most attractive inducements for the occupation of the human race. Lakes and rivers abounded. The earth there yielded abundantly, but the vegetation was free from the excessive development of the equatorial zone. The temperature varied between wide extremes. Whether the motion attributed to the earth in her orbit was sufficient to produce the spiral line described on its surface by the sun's vertical action, was recommended to the consideration of the learned. The actual motion of the earth, it was suggested, required to be more clearly demonstrated. It was also equally questioned whether the motion attributed to the earth was sufficient to dispose of the force generated by the motion of a body around its own axis. If the laws of motion held good with regard to the earth itself, it might be expected to exemplify in its revolutions the results of a composition of forces, arising from centripetal and centrifugal action. After deducing the force of the wedge from the composition of two oblique forces, Newton says—'Thus the forces of the screw may be deduced from a like revolution of forces;' and it might be further observed, that the spiral motion of the earth accorded with the observed action of the sun, and with the forms of a nebula exhibited by Lord Rosse's telescope. He concluded by expressing a hope that the subject of his paper would receive greater attention than it had hitherto.

A somewhat lengthy discussion ensued between the Rev. H. W. KEMP and Mr. SAUNDERS, the former thinking the lecturer had travelled out of his province in dealing with the earth's motion, which called forth a spirited reply from the other.

'Ethnological Remarks upon some of the more Remarkable Varieties of Mankind, represented by Individuals now in London:—1. Zulus; 2. Earthmen (so called); 3. Authalians; 4. Asteks (so called),' by Dr. R. G. LATHAM.—The learned gentleman, after a few prefatory remarks, divided his subject into four parts:—1. The Zulus. Over and above the characteristics of the great Caffre family, to which these Zulus belong, they have another element of value. The tendency of modern research has been to draw a broad line of distinction between the Caffre and the ordinary Negro. Undoubtedly, points of difference exist between the more marked and typical forms of the two families. The present individuals, however, are by no means of this extreme type. On the contrary, they break down the supposed difference, rather than confirm it—and (assuming that the extent to which the typical Caffre of the Cape is contrasted with the ordinary Negro has not been exaggerated) they are valuable as specimens of transition.—2. Earthmen (so called). The term Earthmen is correct, so far as the two individuals to whom it is applied are members of the Bushman family, occupying a country whereof the geological structure affords them caves and similar forms of shelter as the equivalents of houses. They are Bushmen Troglodytes, or (if the expression be preferable) Troglodyte Bushmen. Except so far as the imperfect character of their domestic architecture is the measure of their inferiority, they are in the same category with the other members of the family to which they belong—viz., the Bushman (or Saab) branch of the Hottentot. They seem to represent an extreme type, and to be of unmixed blood.—3. Authalians. As these have not been publicly exhibited, the details in the notice of them will be given somewhat more fully than has been done with the Zulus and the Earthmen. Their locality is the parts about Cape York, their language the Cowraga. The height of the taller of the two was 5 ft. 10 in., of the shorter 5 ft. 9 in.; the chest well developed, but the lower extremities so attenuated as to show that the representation of the two Authalians in Dr. Prichard's one-volume edition is by no means exaggerated. The skin black—forehead prominent (the capacity of the skull being small)—sclerotic a yellow—nose broad at the

base, aquiline, and very characteristic. They held little conversation with each other—so little that, at first, they were supposed to either belong to hostile tribes, or to speak mutually unintelligible languages. This, however, was found, on examination, not to be the case. Temperament, gloomy in one, lively in the other,—neither, however, seemed to be unsuited to the influences of kind treatment; on the contrary, they showed visible signs of emotion on parting with the people of the house wherein they had passed a fortnight; showed great power of that kind of imitation which consists in telling a story in dumb show. Their hair was more crisp and curled than straight; and this is, perhaps, the most important of their physiognomy. The idea of Papua intermixture was entertained, but no proof of it could be found. They are probably full-blooded Aethiopians.—4. *Asteks* (so called). Considering that representations of heads similar to those of the two so-called *Asteks* are found on certain Mexican monuments—that in the case of the *Lacondon* and *Indians*, on the frontiers of *Vera Paly* and *Yucatan* there is an actual instance of a still-existing imperfect independence; that there is special evidence to the existence of gods in the localities around, it is considered that the individuals in question represent the American analogies of the European *cretin*, where the same conditions that have made arrest of development endemic, have preserved an imperfect independence.

'On the Navigation of the Plata, Panama, Paraguay, Verruigo, and Pileomigo,' by H. C. DWERHAGEN.

SECTION F.—STATISTICS.

'An Analysis of the Mortality from Cholera in Hull in the Autumn of 1849,' by Dr. COOPER.—This paper was prepared from the official documents of the late Mr. Thorne (to whose memory the reader paid a tribute of thanks and deep regret) and of Mr. Chatham. By tables is shown the total number of cholera and diarrhoea cases—the former, viz., 1,860, or 1 in 43 of the whole population; the latter 256, or 1 in 355. The number of cases occurring in males was 885; in females, 975. Yet, allowing for the difference of number between the excess in the whole population, the female mortality was the greatest—1 male having died to 1.1 female; while, in the whole population, there is 1 male living to 1.14 female. The diarrhoea return showed no difference in the number of the sexes. The cases were next analyzed as regards age; and it was shown, that in cholera the infant mortality, though very high, was not higher than that which occurs from ordinary causes of death at the same age. The greatest mortality, compared with the annual average, appears to have occurred in the prime of life (from 30 to 35), where the ordinary mortality is very low. There is also an excessive mortality about 60; while the greatest immunity seems to be enjoyed from 15 to 25, and from 40 to 60. In diarrhoea the important feature is, the great excess of infant and old age mortality. The localities in which there had been the greatest mortality were indicated by marking each death upon a map in the place in which it occurred. The map was tinted in shades; showing by deeper shades the parts of the borough where the levels were the lowest, and in which, therefore, the hygienic condition, as regards moisture and drainage, might be presumed to be the most defective. Three principles were found to govern and determine the position of the greatest mortality: the level, the density of the population, and their physical and social character. These points were illustrated by specifying certain localities in which the number of markings showed the disease to have been rife. The last analysis shown was that of occupation, which showed several curious results. The general inference from this analysis was, that 1,738 of the labouring classes and 122 of the gentry, traders, and well-to-do classes had suffered; and, assuming the former class to amount to 67,000, and the latter to 13,000, it follows that 1 in 40 of the labouring class, and 1 in 131 of the well-to-do class, were victims.

'On the Prevalence of Disease in Hull,' by Dr. COOPER.

'The Causes, Extent, and Preventives of Crime, with especial reference to Hull,' by the Rev. J. SELKIRK.

'On the Results of some Researches relative to the New Supplies of Gold, and to the Circulation of Bills of Exchange, 1848-52,' by W. NEW-MARCH.—The quantity of new gold produced in California and Australia, to the end of 1852, is equal to at least 10 per cent. of the total quantity of the gold existing in Europe and America in the early part of 1848, or immediately previous to the first appearance of the Californian supplies. The annual production of gold, from all sources, which, in 1848, was equal to 2 per cent. on the total quantity of gold then existing in Europe and America had risen, in 1852, to 7 per cent. on the quantity. The whole, or nearly the whole, of the new supplies of gold have been absorbed as coinage in America. In this country and Australia, and in France, not only has there been a large increase in the gold coinage of these countries, but the amount of the convertible paper circulation—probably each of them, certainly in three, viz. England, France, and Australia—has been considerably increased within the last twelve months. And it appears that the increase in the circulation of coin and paper has arisen almost wholly from a prior increase in transactions. It is a question, however, for investigation, whether the absorption of the new gold as coin can proceed to a much greater extent without affecting the value of gold, as compared with a larger or smaller number of commodities. In this country there has been, since the summer and autumn of last year, a marked increase in the price of commodities; and it does not appear that that increase of price can in all cases be adequately explained, as concerns the commodities themselves, by considerations of supply and demand. Nor, on the other hand, does it appear that we are justified, by the evidence, in attributing to the influence of the new supplies of gold any extensive or decided influence in raising prices in this country. The facts, however, do justify us in believing that the new supplies have certainly begun indirectly, and, perhaps, directly, to operate in this country in a manner which does and will lead to higher prices. As regards wages, the indirect and direct operation of the new gold in establishing higher rates, is manifest and unquestionable; and since the autumn of 1852, the rise in the wages of artisan and manual labour in this country is equal to between 12 and 20 per cent. It seems to be established by the evidence that whatever effects may have been produced in the United Kingdom, in raising wages and prices, and in extending and increasing trade, have been accomplished by means of reductions in the rate of discount and interest, and by advances of capital, and not in any way through the medium of the circulation. It appears, also, that the effect of the new gold, in depressing the rate of discount, was essentially temporary, and was confined to the period in which the new gold was lodged, chiefly in the Bank of England, in its progress from the mines to the general markets of the world. Since those temporary effects have disappeared, the increased demands for capital, excited by the low rate of discount, and arising out of an extending trade, have raised those rates to fully their previous height. It is the fact, also, that the apparently permanent increase of four millions in the outstanding circulation of the Bank of England has rendered it necessary to consider whether, if the Charter Act of 1844 is to be maintained, the amount of fourteen millions, as the amount of issue notes on securities, should not be considerably enlarged. In the Australian colonies, the effect of the new gold has been to add the stimulus of a very low rate of interest and of an abundance of capital to the other great and manifold causes of rapid development which they previously possessed. And generally we are justified in describing the effects of the new gold as almost wholly beneficial. It has led to the development of new branches of enterprise, to new discoveries, and to the establishment of remote populations, carrying with them energy and the rudiments of a great society. In our own country it has already elevated the condition of the poorer and working

classes—it has quickened and extended trade, and exerted an influence which thus far it is beneficial wherever it has been felt. Such are the conclusions justified by evidence and facts. There still remain the conclusions which seem to be justified by speculation, and these may be compressed within a smaller compass. Apparently there is good reason for believing that the future results of the new supplies of gold will be, on the whole, not less devoid of evil than they have been hitherto. There seems to be no authority for expecting that, under contracts now existing, creditors will be sacrificed to debtors, that the recipients of fixed incomes will be hopelessly impoverished, or that capital will cease to command a reasonable rate of interest. On the contrary, the great revolution pursues its course so gradually, it is moderated and checked in modes so infinite and subtle, and is moulded by influences too delicate to be laid bare by any appliance of statistics, that, so far as we can judge of the future by that which now occurs around us, we may contemplate without fear a change in the economical condition of the world new and startling, doubtless, but already adjusting itself, without shocks or convulsions, to expanding intelligence and resources of mankind. Mr. Newmarch stated the results of some extensive researches relative to the circulation of bills of exchange in Great Britain during the twenty-five years, 1828 to 1852.

SATURDAY.

SECTION G.—MECHANICAL SCIENCE.

'On Railway Accidents by Collision, and their Prevention,' by the Rev. Dr. SCORESBY.—After advertizing briefly to the numerous railway accidents caused by collision, Dr. Scoresby proposed as a means of diminishing, if not of preventing, such occurrences, the adoption of a more frequent and effectual communication by electric telegraph. His plan is to establish telegraph stations at distances not greater than five miles apart, the connexion between them being made by separate wires, and exclusively appropriated to railway signals, and not extending continuously further than from one station to another. Whenever an obstruction occurred on the line it should be signalled in both directions, and no train should be allowed to leave any railway station until a signal had been received from the telegraph station in advance that the line was so far clear. By the adoption of a short code of signals, these communications could be transmitted with great facility, and should any inconvenience be in the first instance experienced at junctions and cross-lines, he had no doubt that a little experience, and adaptation of the arrangements to the special circumstances, would soon remove it. The expense of such a complete system of telegraph signalling would be more than compensated to the railway companies by the avoidance of collisions, and, viewing it only in an economical point of view, the Directors would find it to their advantage to adopt such a plan. As an illustration of the pecuniary losses which railway companies sustain in consequence of accidents by collisions, Dr. Scoresby mentioned the case of a friend of his, a clergyman, who received such severe injury by a collision, that he would be for the rest of his life laid upon his back, unable to perform his clerical duties, and he and his family had to be supported at the cost of the railway company.

'On Railway Collisions, with Suggestions for their Prevention,' by the Rev. F. F. STATHAM.—The plan proposed by Mr. Statham, is to prevent collision by adopting a more effectual means of retarding trains in motion, so that they may be brought to rest within a distance of fifty yards. He made three suggestions,—the first of which was, to retard a train in motion by the expansion of wings, or of fans, to increase the resistance of the air;—the second was, to employ an electromagnetic brake, acting directly on the rails by the attraction of electro-magnets fixed to the carriages;—and the third was, to cause jets of steam to issue from the front of the engine, and thus obtain a reacting resistance from the air.

In the discussion that ensued all the plans were considered. Mr. Statham's fan-retarder was shown to be altogether impracticable,—since, to oppose

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any effectual resistance would require an expansion of acres of surface; nor were the electro-magnetic break and the steam jets considered of much more practical utility. Dr. Scoresby's plan of telegraph signals was approved by several members, as being a more perfect carrying out of the plan which is now adopted; the chief novelty of the proposition consisting in the establishment of district wires and stations at short distances for railway purposes.—Mr. NEISON, who has paid much attention to railway statistics, adduced the following curious computation in illustration of the comparatively few deaths caused by railway accidents:—That if a person were born in a railway carriage, and were to be continually travelling on railways till he was killed by an accident, he would, according to the average number of passengers and deaths, live 960 years.

A Description of some of the large Valves and other Machinery which have been employed for the Discharge of Water at the Manchester Waterworks, by J. F. BATEMAN.—Mr. Bateman described, at great length, the sources of supply and the means adopted for conveying the water from the different collecting reservoirs to the service-reservoir in Manchester, and the peculiar valves required to cut off and regulate the water supply to the inhabitants. The magnitude of the Manchester Waterworks was stated to be greater than that of the Croton Aqueduct at New York, which has been hitherto considered the largest of modern times. The three principal reservoirs will contain 500,000,000 of cubic feet of water, and there are two smaller reservoirs which hold 100,000,000; so that the total quantity stored up for the consumption of Manchester and the neighbouring mills is 600,000,000 cubic feet. The furthest reservoir is 20 miles distant from Manchester, and is 420 feet above the level of the upper part of the city. The daily consumption of the inhabitants is 30,000,000 gallons, which are supplied immediately from a service-reservoir 150 feet above the level of Piccadilly, at the highest part of Manchester. The valves of the main pipes which open and cut off the supply are 40 inches in diameter, and, with a pressure of 150 feet on that area, it would have been impossible, without great labour or complicated machinery, to have opened and closed the valves had they been of the ordinary construction. Mr. Armstrong, of Newcastle, suggested, as a means of overcoming the difficulty, that the large valve should be divided into three, and this plan had been found to not remarkably well. A small compartment of the valve was first withdrawn, and the rush of water through it having filled the pipe, the pressure was counteracted, and the other and larger divisions of the valve could then be easily lifted. By this contrivance the mains could be opened and closed by one man. Another object to be accomplished was to arrest the flow of water in case the large pipes with such a pressure upon them should burst and flood the neighbourhood. This was successfully effected by introducing into the main pipe a kind of flood-gate, which was opened at a certain angle by the ordinary flow of the water, and at that inclination it held suspended, by means of a lever, a heavy weight connected with a throttle-valve. When the rush of water greatly exceeds the ordinary flow, a catch that retains the lever is withdrawn, and the fall of the weight closes the throttle-valve and stops the flow. This self-acting machinery has more than once prevented serious damage that would have arisen from the bursting of the pipes. Another contrivance invented by Mr. Moore, a gentleman in Mr. Bateman's office, deserves mention. The water in the reservoirs is generally beautifully clear, but during heavy rains it becomes turbid, and would be unfit for the consumption of the inhabitants without being filtered. To avoid the inconvenience and expense of filtration, Mr. Moore suggested a plan for separating the turbid water from the clear. A weir was constructed, over the edge of which during dry weather the water in the reservoir flows perpendicularly into a drain-pipe immediately below, which conveys the clear water to the service reservoir; but in heavy rains, when the water is turbid, the extra flow shoots it over the first drain into a second, to con-

vey it to the reservoirs that supply water-power to the mills. By this simple arrangement the turbid and clear waters are separated, and it is calculated that a saving of 100,000*l.* has thus been effected. In supplying Manchester with water, a new kind of fire-plug has been adopted, consisting of a gutta-percha spherical valve, which closes the apertures, and when the water is required to escape, an instrument is introduced which forces down the valve. The great water pressure in the pipes forces it so high that there is no necessity for fire-engines; and the effectual manner in which fires are extinguished by the torrent of water that can be thus applied has greatly diminished the cost of insurance in that city. Mr. Bateman stated, that in large establishments the diminished premiums on fire-insurances produced by the increased facility of extinguishing fires are sufficient to pay the water-rate. Several other arrangements of minor importance which have been introduced in the Manchester Waterworks were also described by Mr. Bateman.

MISCELLANEA

Supply of Books to Workhouses.—The Poor Law Board have issued a notice to the guardians of the several unions and parishes under their controul, stating that, being desirous of promoting the introduction of suitable books into workhouse schools, they have made arrangements with the several publishers to supply books for religious instruction, lesson and text books, and maps for the use of those schools, at a reduction of 52 to 55 per cent., and averaging 43 per cent., on the charge at which they are sold to the public. The works included in this arrangement comprise 185 volumes and 118 maps, and are intended for the use of scholars, teachers, and assistant teachers,—being reading lesson books, and on the subjects of grammar, arithmetic, geography, history, mensuration, vocal music, composition, writing, algebra, natural history, agricultural chemistry, domestic economy, drawing, geometry, mathematics, preservation of health, principles of teaching, political economy, astronomy, and mental philosophy.

TO CORRESPONDENTS.—E. H. B. received.

DECIMAL COINAGE.—We have been inundated with letters on Decimal Coinage since our last communication from A. B. G. on the subject, to an extent for which, under the present overwhelming pressure of scientific matter, we could not in any case have made room;—but there are other reasons why we cannot pursue the subject further in our columns.

D. B. Cork (Thermistis).—The suggestion of this Correspondent has been noticed in the *Athenæum*.

?—The Correspondent who addresses us under this signature—and who has addressed us more than once before, under others—appears to have a good deal of time on his hands, since he takes so much pains to keep others right. We, on the other hand, need the use of all ours for the legitimate purposes of the *Athenæum*,—and must to a large extent sacrifice these if we were to answer the host of communications which we receive similar to those of our Correspondent who represents himself by the "little crooked thing that asks questions." We suggest to our inquisitive Correspondent, that he might himself conveniently have verified his own doubt as to our correctness before he troubled us with it. Begging him not to accept our concession in this instance as a precedent,—we will inform him that we have made the search which he should have saved us, or said nothing about the matter,—and that he and his authority are wrong.

ART COMPETITION.—We have received from a Correspondent, dating from Leeds, what purports to be an answer to certain remarks of ours made as long as three weeks ago on the proceedings of the Committee in reference to the Competition invited for the execution of a monument to the Duke of Wellington in that town. The statement is a somewhat tardy one; and our Correspondent, though he gives his name, states that he is not a member of the Committee, and does not state that he speaks by authority of the Committee. This being the case,—his argument is so singular a one, that we hesitate to deal with it unless we knew that it came from one having access to the facts, and that the Committee adopted this mode of putting them forward.

Erratum.—The misprint of a single letter in our remarks last week on the strange Manchester project of a duplicate Dalton statue, makes curious confusion of our reference to a rival Art-absurdity elsewhere. In the last line but one of the paragraph in question, p. 1095, col. 2, the words "of nymph and of law," should be "of lymph and of law."

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1539	1000	33	13	103 13 4	107 9 0	225 6 0	261 7 4	597 3 8
1540	1100	38	12	25 12 3	28 1 3	39 16 0	67 3 11	1155 2 10
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The BONUS for the present year is the same as that declared last year, viz.: Twenty per Cent. in reduction of the Premium to parties who have made Five Annual Payments or more on the Profit Scale.
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NATIONAL MERCANTILE LIFE ASSURANCE SOCIETY, Poultry, Mansion-house, London.—The Directors have to intimate that the financial year of this Society closes on the 30th of September next, and that all proposals received by the Office before that date will have the advantage of a full year's bonus over those effected subsequently. Prospectuses and full information may be had at the Head Office, or at any of the Society's Agents.

By order of the Directors,
JENKIN JONES, Actuary and Secretary.

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Instituted 1805.
OFFICE, 81, KING WILLIAM-STREET.
President—Charles Franks, Esq.
Vice-President—John Benjamin Heath, Esq.

THIS Society is essentially one of Mutual Assurance, in which the Premiums of its Members are reduced after seven years.
The rate of reduction of the Premiums for the present year was 70 per cent., leaving less than one-third of the original Premium to be paid.
The Society also undertakes other descriptions of Assurance, in which the Assured do not become Members, and having ceased to allow any commission to Agents, the Society has been enabled to reduce the Premiums for this class of Assurances to the following very low rates:—

Age.	£.	s.	d.	Age.	£.	s.	d.	Age.	£.	s.	d.
20	1	13	7	30	2	7	6	40	4	1	9
25	1	17	0	40	2	15	5	50	5	1	0
30	2	1	4	50	3	0	0	60	6	5	10

The Court of Directors are authorized by the Deed of Settlement to advance money on the security of Policies in this Association.
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NOTICE.
The present Septennial period, prior to the next Division of Profits, will terminate on the 2nd of July, 1854.—All Policies now effected (and renewed in force for five years) on the Participating Scale of Premium, will share in the Surplus.
For Prospectuses and Forms of Proposal apply at the Offices above, or to any of the Company's Agents.
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COMPANY, established by Act of Parliament in 1834—5, Waterloo-place, Pall Mall, London.

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The Bonus added to Policies from March, 1834, to December 31, 1847, is as follows:—

Sum Assured.	Time Assured.	Sum added to Policy in 1841.	Sum added to Policy in 1848.	Sum payable at Death.
£5,000	13 yrs. 10 mths.	£69 6 8	£787 10 0	£4,470 16 8
1,000	7 years	.. ..	157 10 0	1,187 10 0
500	1 year	.. ..	11 5 0	511 5 0

*EXAMPLE.—At the commencement of the year 1841, a person aged thirty took out a Policy for 1,000l., the annual payment for which was 54s. 1d.; in 1847 he had paid premiums 108s. 11s. 6d.; but the profits being 8 per cent. per annum on the sum insured (which was 232.10s. per annum for each 1,000l.) he had 157l. 10s. added to the Policy, almost as much as the premiums paid.

Policy Stamps paid by the Company.
The Premiums, nevertheless, are on the most moderate scale, and only one-half need be paid for the first five years, when the Insurance is for Life. Every information will be afforded on application to the Resident Director.

PREMIUMS REDUCED THIRTY PER CENT.
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This Society is established on the tried and approved principle of Mutual Assurance. The funds are accumulated for the exclusive benefit of the Policy-holders, under their own immediate superintendence and control. The Profits are divided annually, and applied in reduction of the current Premiums.
The Annual General Meeting of this Society was held on the 36th of May, 1853, when a Report of the business for the last year was presented, exhibiting a statement of most satisfactory progress. It appeared that whilst the Assurances effected in 1851 were 41 per cent. beyond those of 1850, nearly 70 per cent. beyond those of 1849, and 130 per cent. beyond those of 1848, the Assurances effected in 1852 considerably exceeded those of 1851, 325 new Policies had been issued in that year covering Assurances to the extent of 1,065,000l., the yearly premiums on which amounted to 1,065,13s. It also appeared that the transactions of the first five months of the present year were greater than those of the corresponding months of 1852, or of any preceding year, whilst during the whole period referred to, the claims arising from deaths were much below their estimated amount. A resolution was thereupon passed, continuing a reduction of 30 per cent. on the Premiums payable on all Policies on the participating scale, on which five or more annual premiums had been previously paid.
Credit is allowed for half the Annual Premiums for the first five years.

The following Table exemplifies the effect of the present reduction.

Age when Assured.	Amount Assured.	Annual Premium hitherto paid.	Reduction of 30 per Cent.	Annual Premium now payable.
20	£1,000	£20 17 6	£5 5 3	£14 12 3
25	1,000	23 0 0	6 18 0	16 2 0
35	1,500	43 15 0	13 5 6	30 12 6
45	2,000	80 8 0	24 3 6	56 5 3

A. R. IRVINE, Managing Director.
14, Waterloo-place, London.

IMPERIAL LIFE ASSURANCE COMPANY,
1, Old Broad-street, London. Established 1820.

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Charles Cave, Esq.
Charles Francis Cobb, Esq.
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Henry Davidson, Esq.
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A scale of premiums on insurances for the whole term of life has recently been adopted, by which a material reduction has been made at all ages below 50 years.

Four-fifths, or 80 per cent. of the profits, are assigned to policies effected on this plan; and the surplus to increase the sum insuring to an immediate payment in cash; or to the reduction and ultimate extinction of future premiums.
One-third of the profits on insurances of 2000l. and upwards, for the whole term of life, may remain as a debt upon the policy, to be paid off at convenience; by which means 1,500l. may be insured for the present outlay otherwise required for 1,000l.

LOANS.—The Directors will lend sum of 200l. and upwards on the security of policies effected with this Company for the whole term of life, when they have acquired an adequate value.

SECURITY.—Those who effect insurances with this Company are protected by its large subscribed capital from the risk incurred by members of mutual societies.

CLAIMS.—Since the commencement of the Company upwards of £1,000,000 sterling has been paid in claims and additions to the sums assured.
Insurances without participation in profits may be effected at all ages.
The attention of the public is invited to the 54th section of the Act 10 & 17 Victoria, cap. 34, by which an abatement of income-tax is allowed on such portion of income not exceeding one-sixth as may be applied to the payment of premiums of insurance.

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The premiums are on the lowest scale consistent with security. The Assured are protected by an ample subscribed capital—an assurance fund of 350,000l., invested on mortgage and in the Government stocks—and an income of 77,000l. a year.

Age.	One Year.	Seven Years.	With Profits.	Without Profits.
20	£0 17 8	£0 19 1	£1 15 10	£1 11 10
30	1 5 0	1 2 5	2 5 5	2 0 7
40	1 10 0	1 6 0	3 9 7	2 14 10
50	1 14 1	1 19 10	4 6 8	4 0 11
60	3 2 4	3 17 0	6 19 9	6 0 10

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